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TO LAKE BANGWEOLO AND THE UNEXPLORED REGION OF BRITISH CENTRAL AFRICA.*

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In the beginning of 1890 the British South Africa Company, in pursuance of the splendid enterprise which has marked its short but brilliant history, offered me an opportunity of visiting Lake Bangweolo and the neighbouring regions. It hardly needed a glance at the map of Africa to determine my eager acceptance. Here was the blank space dear to the heart of the explorer, whereon, with a free hand, he might sketch mountain and lake and river, and then long to go and find them realities. Here also was the sacred spot where Livingstone closed his great career, leaving his heart in the land where all his thoughts and aspirations were centred. To fill up that gap in the map, to visit that classic ground, were privileges not to be lightly valued.

In pursuance of my mission, I left England on April 18th, 1890. A visit to the Cape and Kimberley, to receive my final orders from Mr. Rhodes, formed an agreeable interlude in my voyage to East Africa. At Kimberley I had the good fortune to meet Mr. James A. Grant, son of the late Colonel Grant, a name especially dear to the memory of this Society. Mr. Grant promptly accepted the opportunity I offered him of following in the footsteps of his father, and, need I say more, than that he showed himself in everything worthy of his name.

On June 1st we left the Cape, and on the 15th arrived at Kilimane. This town agreeably surprised us, its well-laid-out streets, and quaint houses embowered in groves of palm and mango, banana and orange, forming a charming oasis in a repulsive wilderness of mangrove swamp. We arrived in an evil hour, the Anglo-Portuguese difficulty having then reached a crisis. The anti-English feeling ran high, and expressed itself on the part of the officials in a thousand ludicrously childish,

* Read at the Meeting of the Royal Geographical Society, November 28th, 1892. Map, p. 192.

though none the less annoying, ways. Nevertheless, after a lot of hard work and much trouble, in ten days we were ready to leave with all our belongings safe and sound, and with fifty-five stalwart Makua porters from Mozambique, whose services we secured, thanks to the energetic and generous offices of Mr. Churchill, the then Acting-Consul. At sunset of June 26th we went on board our boat *en route* for Vicenti and the Zambesi by way of the Kwa-Kwa creek and stream.

If time permitted, and new lands did not call for our special attention, it might have been of some interest to describe our observations on the way to the Zambesi. Before our eyes lay a beautiful geographical object-lesson, telling how the land encroaches on the sea and how deltas are formed. Here, seaward, was the mangrove advance-guard, ceaselessly throwing its nets of living rootlets over the floating sediment, and making it land. Behind, over many a sad mile, spread the genuine swamp—half land, half sea—where yet the mangrove held protective sway, and kept firm hold of the reeking repulsive mud. As mile followed mile the land became more firm and solid; the mangrove, its duties over, began to dwindle; more and more wholesome conditions prevailed, and with them brighter forms of vegetation and more cheerful life, until at last Nature displayed herself in all her lavish tropical maturity.

In three days we passed through these various stages, and reached, at the village of Mogarumbo, the limit of the tide. Beyond, the Kwakwa was simply a small winding stream little broader than our boat. But here the chief beauties of the land were found—some of the loveliest spots, indeed, I have anywhere seen in Africa. A series of charming little ponds connected by the narrow winding stream, and circled with groves of giant borassus palms, lay like a jewelled necklet on the broad bosom of Mother Earth. Lilies in full flower spread themselves on the glistening waters, over which the water-birds tripped lightly, while on overhanging bush and tree brilliantly-coloured king-fishers and snow-white egrets kept watchful eyes for unwary fish. The picture is complete if you but add a canoe gliding silently across the water propelled by a naked native, who stands upright in magnificent pose at the stern, and seems a part of his frail craft, so confident is his attitude, so gracefully does he move in harmony with it. Through not one but many of these fairy lakelets we paddled our way, till on the sixth day after leaving Kilimane we reached Vicenti, and the yellow sands, the reed-covered islands, and the glistening waters of the Zambesi lay before us. Much to our delight, we found the *James Stevenson*, the African Lakes Company's steamer, ready to start up the river, and on July 3rd, after the customary trouble with Portuguese officials, we started on our voyage.

On the fourth day we reached the mouth of the Ruo—the boundary-line between English and Portuguese territories. To our unbounded

surprise we were allowed to pass the frontier without being challenged till after we had tied up to the bank. Then it proved that the officials had been caught napping, and to show that they were once more wide awake, they commenced firing big guns to frighten us.

The events of the next few days were full of absorbing interest to us all, but are somewhat outside the scope of a geographical paper. The *James Stevenson*, in attempting to redescend the river, was captured, and her officers sent prisoners to Kilimane. The day following I was myself the victim of a most unwarrantable outrage. While descending the Ruo in a boat, keeping close to the British side, and, therefore, within my rights, I was ordered by the Portuguese to stop. As I took no notice of the challenge, several shots were fired. This having no better effect, the alarm was sounded, and the ludicrous spectacle was presented of an army of over 2000 native soldiers turning out to stop the progress of a single white man and his three servants. Under their commander, Lieutenant Coutinho, the troops lined the banks and fired volley upon volley of blank cartridge at us, while boats started in pursuit. Finding sound and fury of no effect, ball cartridge was resorted to, and my life was placed in the most imminent danger, as well as the lives of a dozen or so of my countrymen on our bank of the river. Still I kept steadily onward, though for a time it looked as if I should scarcely escape being captured. Another minute, however, and I had reached the Shire, and was creeping up under its protecting banks. To add to the laughable display, at the very moment I disappeared round the corner the Portuguese heavy guns began to boom out their angry summons; but it came to our ears transformed into a *feu de joie* over our victory.

All demands for an explanation from Lieutenant Coutinho only elicited from him the statement that he was acting according to orders, and with that I had to be content.

From Chiloma, on the Ruo, Blantyre is usually reached by way of the Shire to the foot of the mountains, and then overland for over 30 miles. For us that route was not convenient. The river was too low for the *James Stevenson*, and there were not sufficient boats for our large party. We determined, therefore, to strike out a new path for ourselves, and cut straight over the mountains, which here form a frowning rampart only a few miles distant.

We left Chiloma on July 12th, and a short march over a rich alluvial plain, made park-like by fine clumps of trees with grassy glades between, and yet tropical with its display of palm and baobab, brought us to the village of Mona. Next day we attacked the mountain barrier, or rather plateau escarpment, and after a hard climb amid pouring rain, reached the top at an altitude of about 4000 feet. Here we found ourselves on the watershed dividing the tributaries of the Ruo from those of the Shire. These uplands proved to be rich and beautiful far beyond our expectations, while the prospect was magnifi-

cent. Away to the south we could command an extensive view over the great plains of the Shire and Zambesi, with their fine isolated mountains. Eastward the great Milanji towered majestically over the plateau. To right and left mountain torrents had carved the land into a hundred picturesque shapes of hill and glen. Dense clumps of bamboo and isolated flat-topped acacias, hoary with clinging lichen, crowned the various eminences, or spread themselves over the slopes. Deep down in sheltering dales, tree fern, wild date palm, and dracæna combined their graceful forms with arborescent giants and festooning creepers to form the gallery forests that so often shade and beautify the streams of Africa. Here, if anywhere, we should have expected to find the native village and the well-tilled garden; but we looked in vain over many a fertile mile. An eloquent silence brooded over the land, and told the usual sad tale of native wars and slave raids. Our thoughts were carried back to the time when Bishop Mackenzie retreated across these very hills, ill and heartbroken, to die at the Ruo, while the simple people for whom he came were butchered, enslaved, or left to starve by the ruthless Wayao. No others of the race reoccupied the ravaged lands, and nature soon, with kindly hand, hid all trace of "man's inhumanity to man," and made as though neither woodman nor tiller of the soil had e'er been there.

Over this delightful country, and still keeping along the watershed, we travelled for four days. Then again we found man the master of the soil. Peace and security beamed on every face, while beads and cloth told of wealth and ease. Friendliness was in the air, and on all hands we were greeted with familiar yet strange "Good-mornings." Here was pleasing evidence indeed that we were nearing our destination for the time being. A few more miles, through well-tilled fields and by populous villages, and we had rounded the granite dome of Soche, and Blantyre was before us. Instinctively we stopped to mark the view, and gladly noted that there was nothing sordid or commonplace in it. The rugged hills of Soche, Nyambadwe, and Dorande, gave the landscape an air of dignity, and with picturesque, protective air overlooked the undulating low grounds that spread between. A little further on and we were able to observe with a new pleasure the green mosaics of the planter, and by-and-by house and store, church and school, appeared on points of vantage. Finally we struck a road—a real genuine road, with wheel-tracks—and following it, found ourselves transported with magical swiftness from a silent African wilderness into the cosy comfort of a Scottish home, where the Glasgow accent reigned in delightful supremacy.

Our surprise and wonderment did not end with our arrival. It required longer and riper acquaintance to adequately comprehend the great work that has been accomplished here by a handful of missionaries and traders, of whom Scotland may well be proud. Unaided

by Maxim guns or Government support, and armed only with moral weapons, they wielded a powerful influence, which embraced a hundred chiefs, and extended over all Nyasaland as far as the distant shores of Tanganyika. Of this influence for good what more eloquent than the fact that thousands of Angoni warriors now come annually from their distant hills to cultivate the fields they were wont only a few years ago to ravage with fire and drench with blood, and, in the most literal sense, turning their war axes into pruning hooks. That is but one of many equally striking transformations which have been effected within a few short years, and I can honestly say that for the first time in all my wide African travels I here found a spot where the advent of the white man might be described as an unmitigated blessing to the natives.

Among the early pioneers of the region there are four who hold an unique place as the founders of British Central Africa, and but for their efforts it would not now be so named or coloured red on our maps. These are, first, the Messrs. Moir, two men who are the very beau-ideal of commercial and philanthropic heroes, men who have suffered and slaved with an unselfish enthusiastic devotion to a noble ideal in a manner beyond all praise.

After these comes the Rev. D. C. Scott, the head of the Blantyre Mission. About him I can only speak in superlatives, at the risk of appearing to exaggerate. The least advertised of missionaries, he yet stands head and shoulders above every other man I know of in the African mission field, whether you consider his personal magnetism, his breadth of view, his depth of culture, or simply the work he has achieved. The church he has planned and built is in its way the most wonderful sight I have seen in Africa. Others will see in his Manyanja dictionary an even greater monument to his genius. His method of teaching goes far to solve the difficult problem how best to influence the negro for good, and is bearing the rich fruit it deserves. Among the varied activities of this capitally-managed mission, not the least interesting is the English and native newspaper issued monthly from its press.

But of subjects for praise there is no end, and I therefore pass on to mention Mr. John Buchanan as the person above all others who has practically shown in what direction Nyasaland must look for its future development. Thanks to him and these three others, the foundations of our empire in South Central Africa have been firmly established, and Mr. Johnston, Her Majesty's Commissioner, is to be congratulated on having the ground so thoroughly prepared for him to enter in and take possession.

But I must leave this fascinating topic, and hurry on to fields and pastures new to geographical science. A few days at Blantyre sufficed to complete our preparations for more extensive travel. On July 21st

we left for Matope, on the Upper Shire, where the lake steamer, the *Domira*, awaited us. Two days later we were steaming against the broad breast of the current, thoroughly enjoying the delightful panorama of tropical scenery that we passed, but need not stop to describe.

On the second day from Matope we entered Lake Nyasa. As I looked across its wide waters and scanned its enclosing mountains I could not but recall that day twelve years ago, when, as leader of the Royal Geographical Society's expedition, I stood at the north end at an altitude of 8000 feet, and surveyed for the first time the magnificent mountains and the wide shimmering sheet of water at their base. But how different the conditions. Then, footsore and weary, broken down with fever and hardship, I reached the north end; now I entered the south in a well-appointed steamer, with not a worry, not a hardship, not a fever to recall, and with men, goods, and health intact for whatever might be before me.

On the 27th we reached Kotakota, an important town on the west side; and here we landed, while the *Domira* went north to bring in Atonga porters from Bandawe, and guns from the north end of the lake. Our reception by Jumbe, the Swahili ruler of Kotakota, was most hospitable, and we passed our time very agreeably making up the loads, and otherwise getting ready for the march.

As a result of barometric observations taken here, we made out the altitude of the lake to be 1430 feet, a result somewhat less than that obtained by some other observers.

Owing to a mishap to the *Domira*, our proposed short stay at Kotakota was extended into a month, much to our disgust, as the dry season was already far spent, and the rains were at hand. It was accordingly August 23rd before we were ready to start.

The expedition, besides Mr. Grant, now included Mr. Charles Wilson, a young fellow who proved to be the best of assistants. Of natives, we had fifty-five Makua and ninety-eight Atonga; but of these only twenty were armed. Our proposed route lay straight west to the Luapula and the south end of Bangweolo, and thence south over the Loangwa-Kafue plateau wherever circumstances permitted or interest led us. At the very moment when all our arrangements were completed, and everything was in marching order Grant was attacked by fever. But with true explorer's spirit he would hear of no delay on his account, and vowed he would have it out with the microbes on the road. We started accordingly, our way for the first two days lying over the cultivated rolling country that here borders the lake. On the third we commenced the ascent of the abrupt escarpment of the plateau, making a somewhat trying march along an inclined buttress, conveniently carved out by mountain streams for the benefit of the traveller. Another day, and the top was reached at an altitude of nearly 4500 feet, and backward we took our last look, over the wooded glen-scarred

face of the escarpment, across the low grounds and the shimmering lake to the distant mountains beyond.

A mile or two further, and unobstructed, the wide expanse of the plateau itself lay spread before us. It was tantalising to find it wrapped in a dim haze when our eager eyes longed to compass so many miles. But if the grey sheen restricted our view, it had its compensations in the softness and glamour which it lent the landscape. A thousand feet above us towered the bold rocky peak of Chipata, which, with lesser hills to north and south, formed a broken yet massive rampart along the plateau edge. A lightly-wooded country stretched away westward, in what would have been a somewhat monotonous sequence of slightly broken reaches, but that through the dim mist a number of sharp isolated peaks broke abruptly from the general level, and caught the eye with their picturesque commanding forms. Conspicuous among these were the massive dome of Bango, the more rugged eminence of Ngara, and, most distant of all, the sharp pyramidal rock of Kasungu. Where we stood we were still in the depopulated country of Marimba, ruled over by Jumbe of Kotakota. Far away to the south-west lay the densely-populated territory of Mpeseni, the Zulu chief, who had conquered and taken possession of the land. To the west-north-west, marked out by its central feature, Kasungu, lay the district of Mwasi. We elected to pass between, along a narrow zone of country which forms a buffer between the two chiefs named, to the perpetual discomfort of its wretched inhabitants.

Our first impression of the country was only intensified by a closer acquaintance. From the edge of the plateau, at an altitude of 4000 feet, the ground sank gently down to 3000 feet some 30 miles from the River Loangwa. Throughout its whole length we crossed no perennial stream save the Bua. No vale, or glen, or gorge gave diversity to the scene. The vegetation was as poor as the surface features were commonplace. Open forests of small gnarled trees did their best to cover the nakedness of the land. They gave it greenness, but little more.

The inhabitants reflected the character of their country. They were few, and their villages far between; and it was clear that their lines had not fallen in pleasant places. Thanks to their unhappy position between Mpeseni and Mwasi, they see in every stranger an enemy, a fact which gave some much-needed colour to our march. Time after time we were assumed to be the inimical strangers bent on death and destruction. Then with startling suddenness the hitherto silent wilderness quivers over many a near and distant mile with the warning cry which calls the men to arms, and sends the women and children to the woods for shelter. Here, there, everywhere, the excited warriors rush to the appointed meeting-places, and, gathering confidence with numbers, approach with threatening cries, spears poised in the

air, or bows stretched to their utmost. In an ever-increasing throng they gather round, working themselves into a frenzy with their fears and hatreds, their savage war-cries and wild antics. This is the moment of danger—the moment which determines whether it is to be peace or war. An accidental shot, an arrow slipped from the drawn bow, and nothing can stop bloodshed. On the other hand, a little coolness, a little confident patience, a little more time for the effervescence of the mad passions aroused, and peace ensues with equal certainty. The threatening cries gradually change to friendly shouts, and the warriors who came to fight remain to dance.

My experience of African war alarms has invariably been the same, and I cannot but believe that many of the fights which have marked the progress of more than one expedition might have been avoided by the recognition of the true character of the demonstration, and the exercise of a little tact and patience on the part of the explorer.

The unhappy villagers who thus received us on our march belong to a branch of the Wa-Nyasa, and do not call for any special description; indeed, to describe them adequately would require a realistic touch more suited to the robust appetites of the ladies and gentlemen of the Anthropological Society than to that of those who gather here.

Before leaving their country, however, let me say that it by no means represents the general character of the plateau. Quite the reverse, in fact. Both north and south a beautiful region, picturesque with hill and dale, and bright throughout the year with flowing streams, affords support to a dense population; but this we did not see till our return, and, consequently, for the time being were very unfavourably impressed.

On September 8th, after a three days' march from Kwa Kenundu, the last Wa-Nyasa village, and a descent of 1000 feet, we reached Kiwende, the country of the Babisa chief Kabwire, in the rich alluvial plains of the River Loangwa. Here our reception was most friendly, and it was pleasant to note the air of comfort and security which characterised the large population. The congenial conditions conducing to this happy state of affairs had been obtained in what will appear to many a strange fashion, Kabwire having been compelled to place himself under the protection of what is popularly supposed to be the native's natural enemy, the Arab trader, in order to defend himself against the bloody slave raids of one who was half a Portuguese. It seems scarcely credible, but it is none the less a thoroughly established fact, that this half-caste scoundrel, Matakenya, has depopulated an enormous tract of country in the Loangwa valley, making Zumbo his headquarters.

At Kabwire's we were confronted with one of those dangers which so often worry the African traveller. Our Atonga, unaccustomed to long expeditions, took fright on finding that they were to proceed beyond the Loangwa, and prepared to desert in a body. Fortunately, we had

timely notice, and by prompt measures put an effectual stop to their plans.

After two days' rest we continued our journey westward. A short march brought us to the banks of the Loangwa, which we here found to be about 100 yards broad, flowing in deep quiet reaches, or in swifter shallows, 4 to 6 feet deep. Of course in the wet season it would show a very different aspect. Its altitude at our camp we ascertained to be 1700 feet. On September 13th we forded the river some 10 miles south of the place where Livingstone crossed on his last great journey, and for two days we travelled over dark alluvial plains, in part well-wooded, in part park-like, and enlivened here and there by herds of antelope and zebra. In this section there were no streams, and the heat was intense. During the succeeding two days pleasanter conditions prevailed. The monotonous plain broke into charming undulations, threaded by many a winding stream and rivulet, and pleasingly wooded on height and hollow.

As far as the Loangwa, the rocks forming the plateau had proved to be metamorphic, with intruding masses of granite. In the valley these were overlaid by sedimentary strata, chiefly red sandstones, shales, and marls. At one place we came upon a remarkable collection of great fossil trees, many of which were 3 feet in diameter, and 40 to 50 feet in length.

On the fourth march from the river we reached Kwakatara, the first village after leaving Kabwire. It nestled comfortably in a pleasant hollow by the side of the River Mpamanzi, and at the base of the so-called Muchinga Mountains, which here overlook the valley with a seemingly unbroken front rising from 2200 to 4500 feet.

To regain the plateau, of which these seeming mountains are in reality the edge, we now took our way upwards along the romantic and picturesque glen of the Mpamanzi. Leaving behind us the sweltering monotonous plains, we speedily feel the bracing effect of the mountain breeze sweeping down the glen. Above us we look up 2000 feet and see grey crag and rugged precipice break in many a wild and threatening shape from the green forests which struggle for a foothold on the nether slopes. Below flows the river, here sweeping past a dense brake of waving bamboo, there lingering to lave the roots of palm and tree-fern bending streamwards, enamoured of their own mirrored loveliness. Anon it seems to sleep in some rock-bound basin, and over it the lilies spread their green leaves and budding flowers, till, waking suddenly again, it sweeps onward under an archway of leafy trees, or dashes itself to foam among obstructing rocks. At any moment the dreaded buffalo may break in fierce rush from that dense brake; there the monkey swings from tree to tree; above the baboons clamour noisily, safe on their distant perch; while the green parrot flits screaming past, striking a discordant note in the softer music of the wind and stream.

Under such attractive conditions we would gladly linger, not two but many days, but that our duty calls us to the wider platform of the heights above, which we eventually attain at an altitude of over 4300 feet.

From our coign of vantage our first glance was for the Lokinga Mountains, which make such a conspicuous figure on our maps. We looked in vain. Neither then nor afterwards did we either see or hear of them. Instead, a scene of unexpected beauty riveted our gaze. Before us spread, far as the eye could reach through a clear atmosphere, a billowy country like the swelling sea, its every feature clad with an unbroken forest, its winding hollows traversed by numerous streams. On this pleasing landscape lay the rich colours of a dawning spring, gorgeous yet delicate, surpassing anything to be seen in the autumn glories of our own woodlands or of the flowery splendours of a Moorish summer. Ruby and crimson—the distinctive tints of the young mimosa leaves—prevailed, and massed together, glowed under the tropic sun like a field of living flame. Interwoven with these, and tempering their brilliancy to a delicious harmony, were the yellows and browns and greens of every subtle tint and tone that marked the foliage of the passing year; Growth and Decay, Life and Death,

> "Alike in glorious livery dight,
> And fair to see."

The forest which decked itself so gorgeously is composed of anything but fine trees. On the contrary, as I can affirm from personal observation, here, as over the whole of East Central Africa, from the Zambesi to the Equator, and from the Great Lakes to the Indian Ocean, the same stunted and gnarled forms prevail. In making this wide statement I am aware that a somewhat similar one, made by Professor Drummond, received a smart criticism from Stanley in the pages of his 'Darkest Africa.' But Stanley's description of an Aruwimi forest was in no way a refutation of Drummond's, which clearly only referred to East Central Africa. The mistake the latter made was in not giving his authorities, and speaking of thousands of miles when he was only acquainted with tens.

The day which introduced us to the beauties of what, for convenience, I call the Loangwa-Kafue plateau, did not end without a jarring note when least expected. Owing to a ridiculous mistake, the Makua porters had their Mohamedan prejudices wounded over the killing of a goat, and flew into a frenzy of excitement which culminated in every man of them marching out of camp, homeward bound as they declared. Though annoyed, we were not alarmed. We took our measures, and next day, though not one of the deserters had come back, Wilson was sent forward with the Atonga, while Grant and I sat down to await the return of the mutineers. Nor were we disappointed in our calculations.

Within a couple of hours they all dropped into camp, crestfallen and shame-faced, and, picking up their loads, hastened off to rejoin the rest of the caravan.

For two days we continued our march westward, over country such as has just been described. A cool breeze tempered the fierce sun, streams were everywhere, and the soil was excellent, though, strangely enough, inhabitants were a-wanting. On the third march we reached the watershed of the plateau, at a height of about 5300 feet. Here we found what we may describe as the attenuated remains of the Lokinga Range, in the form of a series of isolated massive granite domes and peaks, bare of soil or vegetation, rising 500 to 600 feet above the level of the plateau, or to an altitude of close upon 6000 feet. They have received the name of the Vimbe Hills, and trend north and south, marking the watershed of the streams flowing east to the Mpamanzi and other tributaries of the Loangwa, and those running west to the Molembo, Lulimalu, and other affluents of the Luapula.

A few miles west of the Vimbe Hills we passed a curious peak of much-shattered and tilted sandstone, a remnant or outlier of some great series of sedimentary rocks which must at one time have overlain the whole country, and which we found still intact 30 miles further west. Continuing our way, we reached, in a slight depression of the plateau, a lake, some 30 miles in area, and after wading waist-deep for an hour through swamp, we camped in a deserted village on an island. This lake drains into a stream called the Lusiwazi, and having no other name, we gave it that of Moir's Lake, in compliment to the two brothers who have done so much in and for Nyasaland.

Next day, September 21st, we left the island and camped at Kwa-Nansara, or village of Nansara, a female Babisa chief. Here we made a discovery of the most alarming character. Small-pox had broken out in our caravan, and eleven men were already plainly marked with the loathsome disease. There was absolutely but one course for us to take under the circumstances—we must leave the sick behind; and this we accordingly did, after making all possible provision for their safety and comfort.

From Nansara's we still journeyed westward, crossing the head-waters of the Molembo River. Near the village of Serenje we left the undulating wooded country and entered a more hilly district, formed by an outcrop of massive granite running north and south, and marking the junction of a much-altered sandstone formation tilted on edge. Our hopes that we had cut ourselves clear of the small-pox were here doomed to disappointment. To make matters worse, a trackless wilderness lay between us and Lake Bangweolo, the point towards which we were then making. But delay would only have brought us a crop of new troubles; and in spite of everything we elected to push on, in the hope of reaching Chitambo's before we called a halt.

It would be hopeless to attempt to depict the anxieties and worries of that wretched march through the forest. Every day began a new chapter in the story of disease and death; every day fresh victims were to be seen wearily dragging themselves in the rear of the caravan. The temporary porters we engaged deserted. Loads had to be augmented till the healthy men threatened to break down, and by-and-by there was nothing for it but to leave the goods behind. What disturbed us as much as anything under the circumstances was, that Bangweolo, as marked on our maps, receded before us like a mirage. On September 28th we had reached lat. 12° 30′ S., and should have been on the borders of the lake, and north of Chitambo's if our maps were correct, whereas only the River Molembo flowed past us. Our so-called guide, when interrogated, merely stared, and smiled with irritating vacuity. Clearly he was as much astray as we were ourselves.

We were now in very hard straits in every way. Map and guide alike failed us. No path traversed the forest, porters were played out, and food was exhausted. One man had already found a forest grave, and numbers were ready to follow him. All that we could do was to push on north in the faith that the lake must turn up somewhere in that direction.

Our next march was a very long and trying one, without water. Late in the afternoon we reached one of the remarkable sponges which characterise this region in the wet season. Unfortunately, the sponge was dry, although after much digging and hunting we succeeded in getting as much muddy water as sufficed to slake our thirst. You may imagine how exasperating it was for us, situated as we were, to look at our map and note that according to it we were now camped in the lake, and where there should have been "water, water everywhere," there was "not a drop to drink." Moreover, the men had now been two days without food, and everything was going from bad to worse. Two porters were unable to move, and many loads had to be left behind. Our look-out could not well have been worse.

On September 28th, as we pushed doggedly on our way, our hopes were revived by coming first upon some old plantations, then upon a disused path. Gladly following this track, we suddenly emerged from among the trees upon a flat grassy plain of considerable extent. On the further side great clumps of reed and wide stretches of papyrus indicated the probable course of a river. By-and-by we met a native, and from him learned that we were on the banks of the Lulimalu, and that at no great distance ahead was the village of Chitambo. True enough a few miles further and our immediate troubles were over, and soon we were safely camped in a shady grove, and liberally supplied with food and water.

We had indeed reached Chitambo's, but our disappointment may be imagined when we discovered that the Chitambo's of to-day is not the

village where Livingstone breathed his last. Chitambo himself was dead, and his sons reigned in his stead—but not in the same place. They had established their new village 20 miles to the west, so that we were still separated by that distance from the sacred spot we so much wished to visit. Our plague-smitten caravan, however, could not be left for a day, for we ourselves had practically to be the quarantine police, to watch over the well-being of both sick and healthy. The best we could do under the circumstances was to send our most intelligent and trustworthy headman to visit Old Chitambo's with a guide. He returned with the account that the tree under which Livingstone's heart was buried still spreads its protecting branches over the spot, displaying unharmed the inscription cut deep into its bark by the great traveller's faithful followers. To prove this, the Swahili exceeded his instructions so far as to bring back with him part of one of the letters, as well as a few leaves and a fragment of an old box. The former I have placed in the hands of Livingstone's daughter, Mrs. Bruce.

At the New Chitambo we were camped in long. 30·7° east, and lat. 12·14° south, and yet Lake Bangweolo was neither to be seen nor heard of. We were still in a thin forest country, whose distinguishing feature was the numbers of colossal conical ant-mounds rising above the plain 20, 30, and even 40 feet, with a diameter at their base to correspond. These remarkable mud cones were always covered with bush and trees, and presented a very striking spectacle. The forest and ant-mounds continue to a distance of 7 miles north of Chitambo; then follows a great dreary prairie, with a tree here and there, but very few and far between. This is the country of Lunga, which can boast of but one small village, inhabited by Ba-bisa.

From these observations it was made clear to me that as far north as lat. 11° 55′ south there is no lake in the dry season. The most careful and persistent inquiry elicited the following information:—The Lulimalu flows west by north from Old Chitambo's to the neighbourhood of the new village; thence it trends west-north-west till it joins the Luapula after receiving the streams Moenda and Lokulu. A few miles further north, somewhere between lat. 11° 50′ and 12°, the Chambeze also joins the Luapula after receiving the Rivers Lombatwa and Lolotikila. Consequently, in the dry season it does not enter Bangweolo at all. In the wet season, however, a striking change takes place, and once more the Lake resumes pretty nearly the geographical features represented on our maps, though not extending so far south. Its level, then, according to my observations with the mercurial barometer, is 3750 feet, 250 below the height given by Livingstone, and 500 lower than that observed by Giraud. A consideration of the instruments used will best determine which observation is most reliable, and the settlement of the question must be left to impartial geographers.

There is still another correction of some interest to be made in the

geography of this region. Livingstone did not die in the district of Ilala, but in that of Kalinde. Ilala lies to the west along the Luapula.

As illustrating the rapidity with which a journey to Central Africa can now be made, it may be here mentioned that if the time spent at the Cape and at Kotakota be deducted, we had reached Bangweolo in the short space of three months and a half from the time of leaving England.

Our short stay at Chitambo's was productive of a considerable improvement in the condition of most of the sick men, although five of them died there. No new cases had occurred, and we felt justified in once more resuming our journey, time being now of the utmost value. We struck camp on October 5th in a tolerably hopeful mood, though our caravan presented a wretched spectacle, with its long tail of sick porters. We found only too soon, however, that we had reckoned without our host, matters rapidly becoming worse as we proceeded, till at length there was hardly a march without a death on the road, hardly a camp that was not marked by a porter's grave. This was bad enough, but when the alarm spread before us, and we were boycotted, quarantined, and threatened by the natives, who rose in arms against our progress, matters seemed very black indeed. It was only by maintaining a determined front, and by much display of weapons, that we were enabled to push our way onward at all.

And but for that loathsome disease which had fastened its deadly clutch upon our caravan, how pleasant would have been our march. Our way lay through the light forest of Kalinde and Ilala, where stately roan antelopes and great herds of tsessebe watched our passing among the huge ant-mounds. In two days we reached the Luapula, where it sweeps swiftly and majestically, 150 yards broad, from marshy reaches, gleaming with pools and backwaters, and a great series of reed and papyrus-clad islands, into a well-defined channel.

For three more marches the river's course was ours. After the restricted view of the dreary forest wilderness, how delightful it was to travel over the bordering grassy plains, winding round handsome clumps of trees, startling from their midday lair the graceful Vardon's antelope, the water-buck, the whistling reed-buck, and the zebra, lingering by the water's edge to scan some lovely bit of gleaming river, while here a huge ant-mound, there a group of palms, gave an additional flavour of Africa to the beautiful landscape.

Meanwhile we failed not to take due note of the geographical features of the country. Across these verdant meadows rolls the Lohombo River from the mysterious unexplored forest, bringing the streams of Bisa and Ulala to join the Luapula. Further on the Moengashe adds its watery tribute, drawn from the hills and dales of Iramba. Immediately south of the Moengashe the alluvial plains end, and the land gradually rises to some 300 feet above the river-bed,

while the river itself, no longer allowed to wind and linger at will through low verdant meadows, becomes contracted to a breadth of some 70 yards prior to entering a narrow gorge, through which it rushes with great force and swiftness. By-and-by, at Kalonga, the village of the principal chief of Iramba, it spreads out again in wide island-studded reaches, and subsides to quieter progress as it begins its great bend, first north-west, then north, to Lake Moero.

At Kalonga we and the Luapula parted company, our aim now being to reach the Kafue Valley away to the south and south-west. Our route led us over the finest wooded district we had yet traversed, as we ascended towards the watershed of the Congo and Zambesi, crossing the streams and tributaries of the Lukutabwa and the Luembe. We were now in the full bloom of spring, and the rolling uplands of Iramba were decked with a profusion of flowers rarely to be met with in the Tropics. The mimosa, blushing no longer with new-found life, mingled its green leaves with the flowery sprays of convolvulus and clematis. Amaryllis, gladiolas, and tritomas raised their crimson heads with a certain stately elegance above the humbler compositæ, orchids, and polygalas more modestly nestling among the new grass. Many sweet-scented bushes filled the air with their fragrance in the shade of the trees, and in higher places proteas claimed possession of the soil.

Among these fertile uplands, where wooded ridge alternates with grassy hollow, the sable and the roan antelopes, the noble eland, the forest-loving kudu, and the konze love to wander, and are but rarely disturbed by the hunter. Over the whole country reigned a fascinating mixture of types both temperate and tropical; here, some modest composite flower carried our thoughts homeward; there, a startled antelope, the spoor of an elephant, or a stately palm brought them swiftly back to Central Africa.

At the small village of Kwa-Kavoi we found ourselves near the watershed of the country, and at the edge of a trackless forest wilderness, stretching away south into the valley of the Kafue. Here we were unable to obtain a guide, nor was any information to be obtained of the country ahead. It required but a look at our terribly diminished caravan, and our long line of sick, to show that it would be worse than folly to proceed further into that region, destitute alike of paths, food, or inhabitants. By this time, too, I had fallen a victim to what was then to me a mysterious disease, which robbed travel of more than half its joys, and roused the gravest forebodings as to how it would end.

Under these discouraging conditions we elected to keep more easterly than south, hoping to outflank the impassable forest. Even here we were confronted with a trackless wilderness; but a guide was forthcoming, and we were consequently inclined to make light of that difficulty. It proved a very different matter, however, when on the very first march we found ourselves deserted by the guide in question, and

were left with nothing but vague indications to go upon in finding our way to an inhabited region. For four days we had to travel thus, pathless and guideless, and then, happily, just as we began to feel the pinch of hunger and the stings of doubt, we emerged from the forest, and found ourselves once more among cultivated fields.

It was more unpleasant to discover that we were once more within the pestiferous sphere of influence of the slave-raiding half-caste Portuguese from Zumbo. We hear much of the ravages of the Arabs on the Congo. I should like, if circumstances permitted, to describe to you the ghastly work carried on by men with European blood in their veins, which has spread death and desolation over many thousand miles of the Zambesi Basin. We had soon unpleasant evidence of the reputation the Shakundas, as they are called, had acquired. Invariably we were assumed to be of the same race, and to be engaged on the same bloody mission. Our appearance was the signal for the usual frenzied war-cry, the gathering of excited warriors, and the flight of terror-stricken women and children. It was all very well in its way to have confidence that everything would come right; but, meanwhile, there were the uncomfortable half-hours or hours in which we had to sit with smiling faces and persuasive voice, surrounded by hundreds of men in every conceivable form of mad excitment, ever fearing the occurrence of that slight accident which would end so fatally for all. Indeed, looking back upon these anxious moments, one can but wonder that the still small voice of peace ever rose above the threatening clamour, and acted like oil upon troubled waters. Yet so it always was; and everywhere we left friends where we had met, apparently, deadly enemies.

From Pa-Mkwemba we passed south for three marches, following the Moengashe. On the fourth we crossed by a gap, at an elevation of 4500 feet, the Kalera Hills, which here form the dividing line between the Congo and Zambesi Basins. We now struck upon the Lunsefwa, a fine stream, rapidly growing into the dignity of a river as it flowed south to join the Mulungushe and the Loangwa. A range of hills, called the Irumi Hills, struck away south from the Kalera Range, and helped to give a more rugged aspect to the landscape than the succession of grassy plains and wooded uplands to which we had lately been accustomed.

On November 4th we reached the village of the important Iramba chief Mshiri. From this point we proposed to strike west to the Kafue River and the Mashukulumbe by way of Manica; but our plans were, unfortunately, doomed to be upset. Our Atonga porters, desperate on finding their faces once more turned westward, mad with homesickness, and moody with the loss of so many friends and the sight of so many sick, were suddenly inspired with the courage of wild animals at bay. Expostulation, promises, and threats were alike in vain; though 400 miles of to them unknown country lay between them and home they

determined to face all the dangers of murder, slavery, or starvation rather than move one mile further in the opposite direction. So much in earnest were they that I am convinced nothing could have prevented them from putting their resolve into execution short of the guns of the Makua, who at this juncture, though discouraged, were still faithful. At length one night the whole contingent vanished from camp without a sound, and were only caught up and stopped by the promise of a palaver. On reviewing our position it seemed indeed that our only course was to return. Already we had lost more than a third of our men with small-pox; a large number were still suffering; and at that very moment the disease had burst out again with renewed violence. The wet season was now commencing, with all that meant of additional delays, hardships, and unhealthiness at the best of times, and I myself was rapidly breaking down under the illness that had taken hold of me.

However reluctant we might be, we could not but admit that to proceed further under such conditions would savour of recklessness. We determined, therefore, to yield to the inevitable, but on condition that a small number of the men should accompany me as far as Manica, Grant and Wilson remaining behind as hostages of our good faith.

This arrangement was accordingly carried out without delay, and, in spite of daily-increasing illness, I travelled through Urenje to the borders of Manica and back, a distance of close upon 180 miles, doing an average of 20 miles a day. The only incident of the trip which I need allude to here was the meeting with a Portuguese slave raider from Zumbo, whose compound was crowded with young girls and boys, the result of an expedition into the Kafue Valley.

On the tenth day I got back to Mshiri's, and not a moment too soon, for the small-pox had spread to the village, and among the victims was the son of the chief. Regretting sincerely that Mshiri's hospitality should have cost him so dear, we hurriedly completed our preparations, and on November 18th commenced the long return journey to Nyasa.

I must touch but lightly on the events and sights which marked our eastward way. For the men it was a joyous journey, and in spite of rains and mountains and long marches, the small-pox disappeared before their recovered spirits. For myself, it was one long period of torture, every step marked by a throb of pain. Happily, Grant had finally conquered the microbes, and Wilson had never known a day's illness. Both rose to the occasion, and showed they could get on quite well without me—a discovery at once pleasing and humiliating.

With our journey eastward the country began to assume new aspects. Deeper dales cut across our path, steeper and more rugged ridges tried our lungs. To right and left appeared various ranges of mountains, at first distant, then near, each growing loftier and more picturesque the further we advanced.

Our route lay south-east across the Lunsefwa, now an almost unford-

able river, to the Chifukunya Mountains, then north-east to the foot of the irregular range which more or less marks the watershed of the country. Thenceforth to the Loangwa there were no more rolling uplands; all was high mountain and deep glen. From points of vantage we from time to time obtained splendid views southward over the great valley scooped out from the centre of the plateau by the fine River Lukosashe and its numerous large tributaries, to the rocky heights beyond. From an altitude of 3600 feet we rapidly descended to 1300 feet on the Lukosashe, then climbed wearily upward again to over 4000 feet, and crossed the sharp crest of the great Muchinga, after which we sank again to 1300, and were able to drink of the waters of the Loangwa.

At Chilumbangere's we found the wide valley of the Loangwa contracted into a narrow neck by the enclosing mountains. Here we had hoped to have proceeded west to Blantyre, but Matakenya had transformed the beautiful country into a trackless wilderness, for which no guide was to be had. Consequently we were compelled to direct our steps in the direction of Mpeseni's. The expression "our steps" is scarcely correct, for by this time I had to make use of other than my own legs, and submit to the painful ignominy of being carried.

For the first four marches we skirted the base of a range of mountains gradually rising in altitude eastward. For eight more we crossed a succession of hills and glens of varied aspect, but always pleasing and fertile, bringing us at length to Mpeseni's. Here the magnificent possibilities of the fine plateaux we had traversed were made manifest in the dense population and great herds of cattle which the land supported. Our admiration, however, was solely confined to the land, for man in these parts proved to be vile, and Mpeseni vilest of all. For three days we had a most unpleasant time of it in the clutches of this bloodthirsty savage, and failing to get into more friendly relations, we proceeded to a place where a German trader had established his headquarters. On the road a determined attempt was made to plunder part of our caravan. Happily, Grant was at hand, and although armed only with a stick, succeeded in rallying the porters and driving off the warriors. We fortunately suffered no serious loss, though one of the enemy was speared—the first blood shed, by the way, on any of my six African expeditions.

At Wiese's, the German trader before alluded to, matters became worse. We learned that a general muster of warriors had been summoned with the object of attacking us. Nothing was to be gained by fighting, and much might be lost; therefore, deeming discretion the better part of valour, we resolved upon a midnight flight. The flight was by no means unaccompanied by danger—the possibility of such a move on our part having been foreseen by the enemy, and a line of pickets placed across the narrow valley of the Mbarashe. Happily, after

several narrow escapes, we contrived to pass unobserved, and before we stopped we placed little short of 30 miles between us and Wiese's.

On December 30th we camped at the base of Kasungu Peak, and spent the first day of the year 1891 in the hospitable village of Mwasi. Two days later we were once more under the shadow of Chipata, and looking down upon Nyasa. Soon we had reached the low grounds, and, crossing the fields of maize and rice, re-entered Kota-Kota on January 4th, thus bringing to a close our long journey of 1200 miles.

At Kota-Kota we had again a dreary wait for the *Domira*, and it was not till February 18th that we reached Blantyre. Here I surrendered myself to the care of Dr. W. Scott, of the Mission, who, I need hardly say, treated me like a brother. Grant went on to the Cape. Wilson, on the other hand, set off, under my instructions, on a short trip to the west of Katunga. He did his work successfully, but only came back to die of fever after having come through the longer journey scatheless. It was the oft-told African story of a bright and promising career brought prematurely to a close.

In the beginning of August, Grant returned from the Cape and found me on my feet again, but nothing more. He brought inspiring news of further fields to conquer, this time to the west of Bangweolo. That proved a charm more stimulating than any medicine, and under its influence we had everything prepared in a fortnight, loads in the *Domira*, and porters ready to follow. Another day and we should have been off. But at the very moment of departure came countermanding orders, and with a sigh I was fain to turn my face homeward, instead of starting for fresh woods and pastures new, with the happy chance, as Mr. Johnston puts it, of "dying picturesquely in Africa."

I left Blantyre in the middle of August, and reached England on October 18th of last year, while Mr. Grant remained behind to see a little more of African life, though, happily, he is once more among us to-night. If he has failed to acquire his father's fame, it is not through any want of the same high qualities, but simply because he has unfortunately fallen upon a time when a visit to the sources of the Nile, or to Lake Bangweolo, has become one of the commonplaces of travel.

As an appendix to my narrative it may be not altogether valueless to summarise my conclusions about certain aspects of the country traversed. Let me commence with the land.

The general characteristics of the plateau lands to the west of Lake Nyasa are markedly those which prevail in the Shire Highlands, though it seems to me that the average value of the former is considerably above the latter. There is the same free red loam, the result of the denudation of the metamorphic rocks which predominate over the Central African Plateau; the same light forest, free from undergrowth and yet not degenerating into thorny scrub or bush. Its high average value seemed to me quite exceptional for Africa, so much of which is either hopelessly swampy or as hopelessly arid and sterile. Neither the one nor

the other prevailed in even a minor degree over the whole of these favoured uplands, and I consider myself well within the mark when I say that more than three-fourths of the country we traversed is capital agricultural and pastoral land. In this respect it is important to note that the dreaded tsetse fly was nowhere to be seen, except on the low plains bordering the Loangwa. The fact that cattle were found everywhere is even more conclusive proof of its non-existence in the Highlands. Blantyre shows what the land is capable of from an agricultural point of view, while Mpeseni's country amply illustrated its pastoral possibilities. By comparison with these two places I could not but draw the conclusion that thousands of miles of these plateau lands were fit for the planter, and that over them might wander countless herds of cattle and flocks of sheep, fearing neither lack of water nor food, neither overpowering tropical heats, nor yet the deadly tsetse fly.

From the point of view of climate my conclusions are equally favourable.

We have here a region which does not come inconveniently near the equator, while, with a general elevation of nearly 4000 feet, it makes up by altitude what it loses by distance from the temperate zone. The climate may claim to be described as a temperate one. We travelled in the hottest time of the year and yet we never found the days oppressive. On the other hand the nights were always deliciously cool—frequently cold. The very hottest recorded during our journey was at Bangweolo, and then the thermometer only rose to 94°, with a morning temperature of 55°. During the dry season bracing, cool breezes from the east blow all day long. There were no mosquitoes, except in the Loangwa Valley, and that of itself speaks volumes.

With regard to the rainfall, there are no statistics available except those taken at Blantyre. In different seasons it varies from about 50 to 70 inches. The amount, therefore, is not great, and except for a few hours now and then, or, a whole day occasionally, outdoor work is not stopped. As far as we were able to observe and infer, the conditions further west are very much the same. If anything, the rainfall becomes greater towards the west.

From the point of view of health, the whole country must be said to be exceptionally good for Africa. Blantyre has been amply proved to be a place where no European need be afraid to settle, and yet undoubtedly the plateau lands westward are still more healthy. Unlike the former there is no low-lying malaria breeding-grounds near them; there is a generally higher elevation, and therefore a lower temperature; drainage is excellent, and pure water is to be found everywhere.

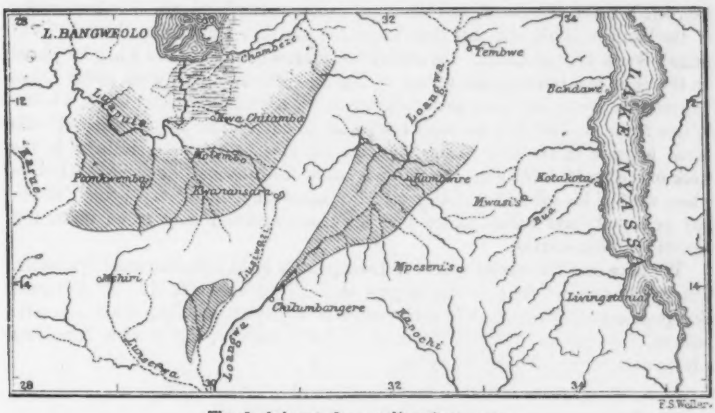
Of the geology of the region we traversed only the very broadest outlines can be given here. The greater part of the country we explored consists of metamorphic rocks. All degrees of metamorphism are found, but quartzites, schists, and gneiss, are the predominating rocks. Through these syenite and granite break their way in considerable masses, forming not uncommonly picturesque peaks, domes, and ranges of hills; the numerous quartz veins form a very special feature in the geology of the region, and the indications of mineral wealth were most striking.

Besides the metamorphic rocks, there are three considerable areas of sedimentary strata overlying and occupying great hollows in the older series, and representing the deposits of former lakes. Thanks to the lesser power of the sedimentary rocks to resist denuding influences, the latter are being largely worked away, revealing the original hollows in the older rocks, which now form the valleys of the Loangwa and the Lukosashe, the depression partly occupied by Bangweolo being the third area. Red sandstone, shales, and marls, in which lie remarkable fossil trees, are the prevalent rocks of the Loangwa Valley; beautiful white and yellow sandstones, with

slightly metamorphosed clays, compose the Bangweolo series, while a coarse-pebbled grit predominates in the Lukosashe area. Through lack of distinctive fossil evidence it was impossible for us to determine the geological horizon of these strata.

About the inhabitants it is impossible to say much in the limits of this paper. In the country between Nyasa and the Loangwa the people are almost entirely composed of various sections of that large group of Bantu negroids named Wa-Nyasa, and now almost entirely ruled over by Zulu chiefs. West of the Loangwa, as far as the Luapula and the Kafue, the people are divided into closely allied tribes, speaking a common language with dialectic differences, but slightly removed from that of the Wa-Nyasa. These tribes are the Ba-bisa, to the east and south-east of Bangweolo, the Ba-usi to the west of the lake, the Ba-Ulala to the south, the Ba-iramba to the south of the great loop of the Luapula.

Between Nyasa and the Loangwa we found but two areas well populated—those of Mwasi and Mpeseni. The Loangwa-Kafue Plateau on the other hand was remarkably thinly populated. Our average experience was to travel from



The shaded part shows sedimentary area.
The unshaded part metamorphic with intrusive granite.

GEOLOGICAL SKETCH-MAP OF CENTRAL AFRICA.

40 to 60 miles to find a small village, and then as much more to find a second. The explanation is to be found in the fact that each village was a law unto itself. There was no common cause made among the villages of the same tribe, and consequently they were eaten up piecemeal.

The prefix Kwa- means "village of"; thus Kwa-Kenundu is the village of Kenundu the chief. In some cases Pa- takes the place of Kwa-, as Pa-Mkwemba.

It is important to note also, from a geographical point of view, that the natives are continually shifting their residence, so that we found no village that could claim to be over ten years old, while every village I have marked in my map will be found shifted by future travellers as much as 10, 20, or more miles. It is therefore clear that their positions have absolutely no geographical value.

A few words about my map and I have done. My route has been carefully worked out by dead reckoning, checked by astronomical observations. By the latter the latitudes of 54 positions were determined. The altitudes have been calculated from aneroid observations, checked repeatedly by the boiling-point thermometer, but more especially George's mercurial standard barometer. For all points of the slightest

interest the altitudes were determined by the last-named instrument. Mr. Coles, the Society's map curator, worked out the observations, and it may therefore be taken for granted that that part of the work has been well and faithfully done.

I here venture to make a suggestion, namely, that the name of Livingstone be given to our sphere of influence north of the Zambesi. At the present moment the name of our greatest African traveller finds no place in the map of the Continent—which he did so much to explore directly, and still more indirectly—except as applied to a deserted mission station on the shores of Lake Nyasa. An opportunity, however, is now open to us to wipe out this reproach. Within the last two years a huge area north of the Zambesi has been coloured red on our maps. Sometimes this gets the clumsy title of British South Central Africa, at others the somewhat better one of Northern Zambesia, though not properly applicable, since it includes a part of the Congo System. Surely Livingstonia would be better. Nothing, too, could be more applicable, for Livingstone made the region in question peculiarly his own. He marked it out by his explorations, forming a ring in which there was but one small gap, left between Bangweolo and the upper course of the Zambesi. The exploration of the Zambesi is his, and that river forms the southern and western boundaries of British South Central Africa. Its eastern boundaries he marked out when he passed up the Shire and sailed on the waters of Nyasa. His last great work about Lakes Tanganyika, Moero and Bangweolo determined the northern boundary lines. Finally in this region he died, and his heart lies buried in one remote corner, while his wife found a grave in another. There, too, are his dreams, becoming realities in the work of the Scottish Missions, the African Lakes Company and the planters. Everywhere we find his spirit stimulating traveller, missionary, trader and planter alike; and yet, as I have remarked, we find his name attached only to an unhealthy deserted mission station.

We have now the special sphere of Livingstone's great influence seeking a name. Can we possibly let the opportunity pass without putting his to it? No historical European name or characteristic native one will be displaced by that of Livingstonia. Instead, it supplies a felt want in a most agreeable manner, and in thus honouring Livingstone we will honour ourselves.

The PRESIDENT remarked before the reading of the paper:—Before I ask our friend Mr. Thomson to read his paper, I should like to call your attention to the fact that we have to-night by very much the longest list of new fellows elected that we have ever had during the long annals of this Society. On the corresponding night of last year we elected seventy fellows, which was more than we had ever elected before. To-night there are, as you have heard, 109. Last year we announced on the same night nine proposals; to-night there are no less than forty. Without further preface, I will call upon Mr. Thomson, who has returned from his sixth expedition, after having walked in his various journeys over 18,000 miles in Africa, to read his paper.

After the reading of the paper, the following discussion took place:—

Mr. J. A. GRANT: After the very interesting paper which we have just heard from Mr. Thomson, it seems almost superfluous for me to make any remarks. Mr. Thomson has very eloquently described to you the country through which his kindness permitted me to travel, and I think there is no point in the paper which he has read to you to-night which I could in any way criticise, and there is nothing left in the journey, so far as I can remember, which he has not brought before you, and which would be of interest from a geographical point of view. The paper which he has read makes me almost feel that I could be again in that most fascinating

country, going through the scenes he has so truthfully and graphically described. One point in the paper we have just heard opens a topic of great interest at the present time. Mr. Thomson told us that within three-and-a-half months of leaving England he reached the shore of Lake Bangweolo. Now this in itself is a novel and interesting fact, but still not of much importance if it did not point out to us that the centre of Africa is not so very remote and inaccessible as commonly supposed. I think that at the present time by common consent we are agreed that the centre of this dark continent, this darkest Africa, must see the light of civilisation and humanity. We hear of railways which are to be built, to aid in this great work, and railways doubtless are necessary. But I would call your attention for a moment to this route into Central Africa which Mr. Thomson employed on the occasion of his last journey from the mouth of the Zambesi to the north end of Nyasa. It is of the greatest convenience to those who wish to enter Central Africa, for we have a permanent waterway which nature has given us of 700 miles from the mouth of the Zambesi to the north end of Lake Nyasa. It is not exactly an unbroken line of communication, for in the Shire, as you know, there are the Murchison Rapids which extend over a distance of nearly 60 miles. From the north end of Nyasa to the south of Tanganyika you have but a fortnight's pleasant journey over a beautiful plateau, when a lake of 400 miles in length stretches out before you, at the north end of which we are within measurable distance of the Victoria, within easy distance of what is perhaps the most interesting part of Central Africa. It looks almost as if nature in her bounty considered the African Continent too broad, and gave us another coast-line in Central Africa, passing by some countries which have already proved to be most fertile and beautiful. One rider to add to this route is the drying up of the lakes, and consequent lack of water in their outlets. When Dr. Livingstone went up the Zambesi, he reached Katunga, the port of Blantyre, in a boat drawing, if I mistake not, 5 to 6 feet of water, but at the present time it is with the greatest difficulty that a boat drawing 2 feet can get up to that place, and on the shores of Lake Nyasa native testimony corroborated what we saw on every side manifest, signs that the lake is surely and steadily failing. This is a most interesting and difficult question, but it is not for me to discuss to-night. The most feasible explanation to me seems cycles of rain. At the present time the lakes in this district are steadily failing; we can but hope that again the rain will come and the lakes fill up. In the paper which has been just read there is another point which I will detain you for a moment to discuss. Mr. Thomson said when he was laid low by sickness that Wilson and I rose to the occasion and took his place. Well, gentlemen, poor Wilson, I am sure, would be the first to join with me in saying that, although the sickness laid Thomson low, that pluck and discrimination which have placed Mr. Thomson in the foremost position among African travellers still made him the guiding star of our caravan. But it remains for me to express my gratitude for the kind way in which you have received me, knowing as I do that it is due to the memory of one who is no longer amongst us, one who for over thirty years enjoyed your confidence, and who was so proud of your unvaried kindness.

Commander V. L. Cameron, R.N.: I wish to congratulate Mr. Thomson on his return to health, and on his being able to be here to tell us his story of this interesting journey. I also wish to congratulate the son of my old friend, Colonel Grant, on his safe return to Europe, and on the way in which he has spoken before us to-night. The journey, which has been so graphically laid before us, is one of great interest. Of course we knew something of the country from previous travellers, but it has been laid before us to-night in detail, never before equalled. One of the things which may have an important bearing on the future of this country, is the position of the

Muchingo Mountains, but which has never been definitely laid down. If nothing else had been done but this, a very important result would have been achieved. I think once before, when congratulating Mr. Thomson on his journey through Masailand, I saw that he had discovered a country fit for colonisation; so again here I can congratulate him on having laid before us a country we English can go and open up, and I think I may be allowed to congratulate him most heartily on the great results which he has achieved.

Dr. MALONEY: I have listened with very great pleasure to the instructive account of Mr. Joseph Thomson's travels, and I have only to endorse, as far as my personal experience goes, everything he has said. This great extent of country only requires civilisation to make it one of the greatest countries of the Earth; but it is evident that civilisation can only be introduced by opening up the country, and nature has already provided a way of entry, as both Mr. Thomson and Mr. Grant have mentioned, by the Zambesi, Shire and Lake systems. I hope soon to be able to give an account of our experiences in a recent journey to Katanga or Msiri's country, in which I acted as Medical Officer under the late Capt. Stairs; and here I must stop to say that a nobler, braver Englishman than that officer never existed; and I fervently wish that he might have been here to-night to give the world some idea, through this meeting, of the work he performed on this expedition. Mr. Thomson has remarked on the condition of some parts of the country devastated by the slave trade. We ourselves in passing through that part of the country, from Lake Moero to Tanganyika, saw many evidences of the presence of the Arab slave-dealer; but I think that the advent of fixed government and legitimate trade will change the habits of this gentleman, and that he may, under a new state of affairs, become a benefit to, in the place of being the curse of Central Africa. I have only to conclude by saying, that so long as we have men like Mr. Thomson, who in spite of serious and painful illness can do such work as he has done, we may safely say that the future of this great country is assured; and I feel sure you will all join with me in wishing him a speedy return to health and the work to which he has devoted his life.

Lieut. CRICHTON BROWNE:—Having been once lieutenant to Mr. Joseph Thomson, serving in one of his expeditions and having considered myself privileged in so doing, I beg to be permitted to congratulate him on the interesting paper which he has read, and his restoration to health after a severe and prolonged illness.

Mr. ARNOT: I hope Mr. Thomson will be able to show us clearly all the advantages of this route to the interior, as to the cost of transport and the possibilities of procuring carriage for the use of intending passengers. The difficulty usually is where and how to get carriers. As may be known to this society, I have been for a few years occupied in reaching Garenganze in the Katanga country to the west of Bangweolo, and have found at the port of Benguella, as it were, the soft end of the cocoanut. The whole west coast of Africa is comparatively inaccessible, but by means of cultivating friendship with chiefs in the interior we are able to procure fresh carriers; and I may mention here that one of the great difficulties of African travel would be removed if some simpler way of carriage could be devised. Is there no remedy but a railway, no intermediate way? Could not the South African waggon be utilised? It is a question that should be considered by this society. I have followed Mr. Thomson's journey with real interest and can sympathise with him in his efforts at all costs to settle matters peaceably. I could tell you of spending forty-eight hours in the middle of one of these African turmoils, the whole country seemingly bent on bloodshed, and all ending in peace. The Africans remind me much of the simple Irish character, ready to fight on the slightest provocation, but so soon as they understand you are a man of peace they welcome you with friend-

ship and cordiality. Above all things we want men of peace in Central Africa. While Mr. Thomson's carriers were suffering from small pox, I was a few hundred miles away beleaguered similarly with a caravan of three hundred porters. We had two hundred cases more or less severe and only twenty deaths, but we had sufficient food; and by nursing the men carefully and giving them plenty of rest, after a very small percentage of loss we were able to resume the journey again. In closing my remarks I must congratulate Mr. Thomson and Mr. Grant on their successful journey.

Commander KEANE, R.N.: I had no intention of speaking at all when I came, but was only going to listen to the story of a very well-managed and successful journey by my friend Mr. Thomson. I was at Blantyre when he returned, and am very pleased to say Mr. Thomson looks much better than he did then; I am also very pleased that my friend Mr. Grant has spoken of that interior route. I have long been impressed with its value and have done my best to impress it upon others. You have only to start at the mouth of the Zambesi and with little or no difficulty find yourself in the Mediterranean. I am pleased to be able to tell you that H.M. Government are well forward in this matter. I hope to be able to place three gunboats flying the white ensign on Lake Nyasa before October next. Give us one more gunboat to put on Tanganyika, and Ujiji becomes the port of Uganda, and as I have said before, the nation that holds that waterway holds the key to the whole mass of land. In this I am very interested, and am working hard that I may be able to assist to get goods, food and everything else, not overland, not on men's heads, but in boats, and I think we shall succeed.

The PRESIDENT: After every speaker has congratulated Mr. Thomson upon his extremely interesting journey, his extraordinary personal endurance and upon his restoration to comparative health, you will all wish me to do the same in your name, and you will include, I doubt not, in your thanks all those who have spoken to-night, most especially Mr. Grant, whom we hail as a worthy son and successor to one of our oldest friends and one of the greatest heroes of African travel.

Mr. THOMSON'S MAP.—Mr. Thomson's route having been plotted by the explorer himself, from his bearings, distances, and observed latitudes, has been adjusted to the following points determined by astronomical observations, viz:—

Blantyre	15 45 29 S.	35 3 54 E. (H. E. O'Neill)
Matope	15 22 15 S.	34 56 9 E. (James Stewart)
Livingstonia	14 1 52 S.	34 52 32 E. (O'Neill and Stewart)
Bandawe	11 55 55 S.	34 12 53 E. (mean the same)
Kawende Point ..	11 32 0 S.	29 47 45 E. (Lieut. Giraud).

No difficulty has been experienced in connecting Mr. Thomson's new route with the routes of previous explorers, and especially with those followed by Captains Capello and Ivens.

The following statement with regard to Mr. Thomson's altitudes is made by Mr. John Coles, the Society's Map Curator:—

The observations from which these heights are computed have been very carefully and systematically taken. In the computations I have, in all cases, corrected the readings of the aneroid for the errors shown by comparison with the mercurial barometer, or B.P. thermometer. I have also applied corrections for the daily range of the barometer and thermometer and also for the latitude. The data given in Hann's Meteorological Charts have been used for the lower station, and as these are only general means, the absolute altitudes above sea-level determined by them must be considered as approximates; the difference of level between different stations is, however, very nearly accurate.

JOURNEYS IN THE BENIN COUNTRY, WEST AFRICA.*

By Captain H. L. GALLWEY, H.M. Vice-Consul to the Oil Rivers Protectorate.

THE part of the world that I am going to speak about is the Benin country, West Africa. Owing to the want of proper surveying instruments I was very much hampered in my mapping work. On my return to Africa, early next year (1893), I hope to be able to furnish the Society with more reliable maps of this particular region.

It is extraordinary how little appears to be known about the Benin country. Dapper and Barbot, geographical writers of the 17th and 18th centuries, give a certain amount of information on the subject; but their works were for the most part compiled from the observations of others, and not from personal experience, and consequently their statements can only be accepted with a certain amount of caution.

The Benin River is the western boundary of the lately-formed Oil Rivers Protectorate, the mouth being situated about long. 5° 3′ E. and lat. 5° 46′ N.; the general course of the stream is west-north-west. Like all African rivers on the west coast, the Benin River is approached by a bar, the width of the navigable part being about half a mile, with a depth of water at high tide of from 13 to 14 feet; consequently only small steamers drawing up to 12 feet of water can enter the river by the mouth. Large steamers have to enter the Forcados River, proceeding from thence to Benin by the creeks. These creeks are very difficult to navigate owing to their tortuous nature, there being sharp turns every few hundred yards. The river is about 2 miles wide at the mouth, narrowing by degrees to 1½ mile at Batere, 1 mile at Young Town, ¾ mile at America, and dwindling down until it is only about 30 yards wide, and sometimes less, above Aruca; but widening a little at Sapele. Here a bifurcation takes place, one arm having been named the Jamieson by a gentleman of that name in 1839, and the other the Ethiope by Consul Beecroft in the following year.

To return to the mouth of the river. The whole of this part of the coast is one extensive mangrove swamp, intersected by a network of creeks. Very little solid ground is to be found, there being only occasional patches here and there. These mangrove swamps are veritable hot-beds of fever, and in consequence this part of the West African coast ranks among the most unhealthy places in the world. After crossing the bar, and ascending the river for about 5 miles, we come to the European factories, which are situated at intervals for several miles along the river, all being on the right

* Paper read at the meeting of the Royal Geographical Society, December 5th, 1892.

bank. A factory consists of a dwelling-house, substantially built and very comfortable, warehouses, and stores. In the olden days the traders lived in hulks; but these are now entirely replaced by very commodious houses. In fact, a great change has come over the life of a West African trader of late years. Pleasant social gatherings, in the shape of cricket, lawn tennis, and such pastimes, now take the place of the debauches of the past.

In the days of the Portuguese supremacy trade was almost entirely confined to slaves and ivory; now palm-oil is the chief production. Very little ivory comes down the river. A large trade is also done in palm kernels, although not in the King of Benin's dominion, a fetish veto having always been placed upon it. However, since the conclusion of a treaty between Her Majesty and the King in March last, the latter personage has expressed his willingness to open up the kernel trade. In the same way many valuable trade products are lying untouched in this dusky potentate's territories, owing to the fetish rule of that unfortunate land. It is to be hoped, however, that all this will be changed before very long, although a very great deal of tact and patience will have to be brought into play. A small amount of rubber is exported, but is hardly worth mentioning, although the country abounds in this particular product, as well as in gum copal, gum arabic, incense gums, mahogany, hardwoods, and fibres of every kind. Tobacco, coffee, and cocoa would thrive well, although I doubt whether it would pay Europeans to grow these articles, especially coffee. Until very recently all the factories were at the mouth of the river, but now there are two at Gwato and two at Sapele. Sapele is the point at which the bifurcation of the two arms of the river takes place, and it is here that the Jakri and Sobo tribes join.

The Jakris have hitherto acted as middlemen between the white traders and the oil producers; they naturally resent any white trader establishing a factory up-country, and thereby dealing direct with the oil producers; consequently they do their best to obstruct any move in this direction. Taking these facts into consideration, it will probably be some time before the Sapele factories do very much trade. On the other hand, the oil producers are very anxious to trade direct with the white man; but they are afraid of the Jakris, and will continue to be so until a military post is established at Sapele. The Vice-Consulate has been, and is at present, established near the mouth of the river; but in a very short time it will be moved up to Sapele. This will have the effect of giving confidence to the Sobos, and at the same time an eye can be more easily kept on the Jakris.

To return to the river. During the neap tides the water rises and falls about 4½ feet; during the springs 6½ feet, and even more. The tide runs from 4 to 5 miles an hour. The rise and fall of tide is felt as far as Kanaka on the Ethiope, and Gbiye on the Jamieson. Above these

points the water is always running down. Between Eku and the Sobo plains the current is very rapid, and above that it becomes almost a torrent. A launch drawing 5 feet of water can go right up to Sapoba on the one branch, and Eku on the other, though one has to be very careful to avoid the snags, i.e., sunken trees, which are everywhere.

After ascending the river about 6 miles we come to the Deli Creek. This waterway leads into the Escardos River, and is navigable for launches, but is too narrow and tortuous for even small steamers. In about a couple of miles we reach the Lagos Creek, the entrance to the inland waters connecting the Benin River with Lagos. Last year (1891) Mr. Haly Hutton and I managed to navigate this channel, thereby having the small satisfaction of being the first Europeans to get through by this route. It appears that several attempts had previously been made to reach the Benin River from Lagos, but Arogbo was the furthest point touched. This place is about 50 miles from the Benin River. On the occasion I mention our craft was a large gig-canoe, lent to me by Nanna, the leading Jakri chief, manned by thirty men. Nanna objected to supply me with a crew, as he said that if once his slaves knew the way to Lagos they would all eventually run away, Lagos being a free country. However, a chief named Dore, not having the same scruples, gave me all the men I required.

Leaving the river on a Tuesday (Dec. 7th, 1891) we reached Lagos the following Sunday, thus taking five days to do the 170 miles. We paddled only during the day, i.e., from 5 A.M. to 9 P.M. The region through which we passed was very uninteresting, there being no open country of any kind. The mangrove disappeared about 25 miles after leaving the Benin River, and reappeared about 15 miles from Lagos. As far as Aboto the waterway is very narrow, in some places being less than 10 yards wide; above that place the stream widens, the banks get higher, and the forest scenery is very beautiful. On the evening of the third day we reached the Lekki Lagoon, a lovely sheet of water dotted with islands covered with grand forest trees, creepers, and ferns of every kind. This lagoon is about 30 miles long, and 15 miles broad in the widest part, and was very refreshing after three days of narrow creeks. The natives of the country through which we passed gave us no trouble of any kind, although we had been led to suppose that they might prove disagreeable. In fact Aboto was the only place where they took any notice of us. Here the chief sent a message to know why the white man passed by without calling on him—a message which required no answer.

As regards the future use of this inland waterway, I fear it will not prove of very much value. Some of the grass obstructions that had to be got through were formidable. In many cases the canoe had to be lifted along, and in one place we had to go through about

2 miles of high grass, quite impassable by a launch of any description. In addition to this, the snags, especially near Arogbo, were a decided bar to any craft other than a canoe getting past.

To return to the river once more. Shortly after passing the Lagos Creek we come to two more factories, and a little further on to a narrow creek leading to Broheme, where Nanna, the chief already referred to, resides. This town is very well built, and is quite a model native settlement. It is kept scrupulously clean, Nanna's own house being built according to European ideas. This chief is a superior sort of native, and is very wealthy. He is greatly feared by the neighbouring chiefs. About 10 miles further up the river we reach Young Town, where steamers enter the river after coming through the creeks from Forcados. Opposite Young Town is the Gwato Creek, the waterway to the town of that name, the landing-place for Benin city. I made a survey of the creek, but unfortunately mislaid it. Another 5 miles sees the last of the mangroves, the ground becomes firmer, and the banks higher, the foliage being chiefly palm trees. The scenery varies very little. The river gets narrower and narrower, though there is plenty of water right up to the edge of the bush. Passing a few small towns and villages, we reach Sapele, about 50 miles from the mouth of the river, where the bifurcation before alluded to takes place. Steamers drawing up to 14 feet of water can run up to this place, where there is an excellent anchorage. We now enter the forest region, the country being one impenetrable forest, with small clearings here and there where the towns and villages are built. The trees are magnificent, the most noticeable being the cotton and mahogany.

As we follow the stream up the northern arm the water gets clearer and clearer, being covered with masses of lovely white lilies; the banks become higher, and are covered with exquisite foliage. You see here and there long high walls of beautiful ferns stretching from tree to tree. The banks on each side are covered with orchids, flowering trees, and shrubs of every kind. The air is simply alive with the most gorgeous butterflies. The river is now very narrow and "twisty," there being sharp turns every few hundred yards. There are several towns, or rather villages, on each bank, all being oil markets. About 30 miles from Sapele is Sapoba, where the river practically ends, i.e., as far as navigation goes. In November, 1891, I traced the stream still further by wending my way through the forest trees in a small canoe; and from what the natives told me reached a spot about 3 miles further on which was about an hour's walk from the actual source of this arm of the river. This they described as a large pool, in which the water bubbled up out of the ground; they declared no water ran into this pool. However, on my return to Benin next year I intend to test the accuracy of their statements. My Jakri guide was somewhat loth to conduct me to this pool, as the people about there apparently regard it with a certain

amount of superstitious awe. I am convinced that the river, both this arm and the Ethiope, does not come from the Niger. The water is so deliciously clear, more especially so above Utamara, on the Ethiope, where it is as clear as crystal. You can see the bottom quite distinctly, although the water is 2½ fathoms deep at that place; the current is, moreover, very rapid. Presuming that the Jamieson branch rises in the pool, as described by the natives, I fancy it will eventually be found that the Ethiope rises in the high ground north-west of the Niger.

Returning to Sapele, let us now ascend the Ethiope. This branch is also very narrow, but hardly as tortuous as the Jamieson, at all events not until you reach Eku; after that it becomes narrower, and could not well be more winding than it is, the current being much swifter than on the other branch. The forest scenery up this way is even more lovely than that already described. After reaching Eku, where we anchor our launch in about 10 feet of crystal water, we get into a canoe and paddle up stream, reaching the Sobo plains about 9 miles further on. These plains were mentioned by Consul Beecroft in 1840, and were the furthest point reached by any white man in this direction prior to last year (1891). They extend as far as the eye can reach, there being no signs of either animal or human life. These plains are covered with long grass, the soil being sandy, clumps of trees dotted here and there—an ideal spot for big game, though we saw none. Another 9 miles or so brings us to Demovia, in the Abrakar-Sobo country, the stream in some of the narrowest places nearly approaching to a torrent. From here we went 5 or 6 miles inland to a place called Abrakar, passing through many well-kept farms, chiefly pepper plantations, on the way. This was the furthest point reached by me in May 1892. When once clear of the mangrove swamps of the coast the soil is almost entirely red clay. There are no roads, the only substitutes being tracks through the forest, on which you have to walk in single file. Nearly all communication is carried on by means of the waterways. Beasts of burden of any kind are unknown, all carrying being done by the people.

As I remarked before, the climate of this region is very unhealthy, though its effect on Europeans depends a great deal on how they live. The temperature is equable, ranging from 92° to 70° in the house. The characteristics are those of West Africa generally, and it is unnecessary to repeat the details. As regards sport, you could not go to a worse place. There are plenty of bush-deer, a species of antelope; but they are very hard to get at, the bush being so very thick. Crocodiles abound, but you soon get tired of shooting them. The only really good shooting to be got is curlew. I never came across any hippo in the river, though I did nearer the Niger. There must be plenty of elephants in the Benin country, judging by the tremendous stores of ivory in possession of the king of that land. Monkeys swarm in the forests, but they hardly come under the head of game!

Let me now refer briefly to the tribes that people this part of the world. First we come to the Jakris, who are connected in race and language with the Yoruba people, extending from the Mahin country on the west to the Forcados on the east, and inland about as far as Sapele. The last king of the Jakris died in 1848, after which, and until recently, the people appointed a governor, whose powers were very limited, and the state of the river became one of anarchy. The Jakris act as middlemen in the trade between the white traders and the oil producers. They are a very timid race, and have very little idea of fighting. Domestic slavery is in existence, most of the slaves being bought from the neighbouring Sobo tribe. The value of a full-grown man is about £10. The Jakris are free men, and do no work. All their towns are built in the bush, the trees acting as a sort of natural screen in case of attack. The people are pagans. Their customs are barbarous; but now that the country is under British rule these things will disappear in time. There are several Ijo settlements in the Jakri country. The Ijos are a much-abused race, and were once inveterate cannibals; even now they do not object to a tender morsel of human flesh when the opportunity offers. Domestic slavery as it exists in the Jakri country has many points in its favour. There is really very little difference between the lot of a good slave and a freeman, except that the former works while the latter does not. They are housed and fed by their masters, and are given positions of trust, and in many cases they rise to be masters themselves, as in the case of the late King Ja-Ja of Opobo, who was originally a slave. Some of the Jakri chiefs display a very fair show of wealth, which usually takes the form of silks, coral, gold and silver ornaments, all specially ordered for them by the white traders. I have seen Nanna with seven or eight hundred pounds worth of coral on him.

The next tribe we come to is the Sobo, inhabiting the country on the left bank of the Ethiope River. They are a very timid race, given to agriculture, their chief occupation being the manufacture of palm oil. They recognise no common head, the country being divided among a number of chiefs, who are always quarrelling among themselves. Like the Jakris, these people are pagans; they do not keep slaves, but are bought as such by the Benin and Jakri people.

Next come the Benin people, the regular inhabitants of the vast Benin kingdom. It is difficult to say exactly how far this kingdom extends, and I should doubt if the king himself knows. About forty years ago it was supposed that he claimed territory up to within 50 miles of Lokoja, at the confluence of the Niger and Benue Rivers. The River Ethiope is probably the south-eastern boundary of this kingdom. Many states pay tribute to the king. The tribute is collected yearly, the king sending his so-called war-men to collect it. The inhabitants are somewhat superior to the neighbouring coast tribes, but

can hardly be called a brave people. They are given to agriculture, and are great hunters. Judging from the king's stock of ivory, the country must abound in elephants. When an elephant is killed the king claims one tusk, the other going to the hunter; but the king has the option of buying it if he wishes to. Christianity has never yet reached this country, although tradition says that the king of Great Benin city some time in the fifteenth century offered, for the small consideration of a white wife, to drive all his subjects into the pale of the church.

Before bringing this paper to a close, I will give you a short account of a visit to Benin city, the capital of the country, and the seat of government. I had the good fortune to be sent on a mission there last March (1892), the object being to conclude a treaty with the king, which object was fortunately successful, and the extensive dominions of the King of Benin are now under Her Majesty's protection. Very few Englishmen have ever visited the city of Benin. Prior to 1890 it would appear that only about three of our countrymen had been there. From all accounts the manners and customs of the people have changed very little since the days of Nyendale, in 1702. I was accompanied by Mr. Haly Hutton, Dr. Hanley, and Mr. Swainson.

We left the Vice-Consulate, near the mouth of the river, in a launch. Five hours' steaming brought us to Gwato. It was here that the great Belzoni, of Egyptian fame, died in 1823. There is, however, no trace of his last resting-place. Gwato was a large town once, but has suffered considerably during the frequent wars of past years. It is now only a small village, and it is here that the Benin people bring their oil and other produce to the white trader, there being two factories at this place. At present Gwato is the only place that the king will allow white men to land at with a view to visiting Benin city, all other routes being placed under fetish veto. However, it is to be hoped that before long all such foolish ideas will be dispelled. On our arrival at Gwato messengers were quickly despatched to the king to acquaint him of our coming.

Benin city lies about 25 miles from Gwato, the whole route being through a dense forest, with the exception of the last mile or two. We slept at Gwato that night, and started early next morning on our march, halting at a place called Egoru for the night, having done 16 miles of the journey. Just before reaching the city we had to pass through rather an unpleasant half mile of fairly open country. We presumed it was the place where all criminals' bodies were deposited. The path was strewn on both sides with dead bodies in every stage of decomposition; skulls grinned at you from every direction—a gruesome experience in its way. On reaching the city we found the king had told off a couple of very decent houses for our use. One we took possession of, and put our carriers in the other. These houses were built of red clay, having a high wall all round forming a sort of court yard. There were two

fair rooms, and many uncanny alcoves; skulls, human and otherwise, hung around promiscuously. The walls were adorned with the impressions of a very large hand in lime and blood. The roof was a thatched one, full of creeping things.

I will not weary you with an account of our five days' stay in this extraordinary place. The king had promised to see me on my arrival, but it was three days before he gave me an audience. However, the result was very satisfactory, so one cannot complain. Benin city is the seat of a very powerful theocracy of fetish priests. The king is all-powerful, though he would appear to be somewhat in the hands of his big men, and very much tied down by fetish customs. He only goes amongst his people once a year, the occasion being one of general rejoicing and feasting. Human sacrifices are of frequent occurrence, and the rule is one of terror. The usual form of sacrifice is crucifixion. We saw several crucified victims during our stay in Benin city, on the plain outside the king's residence. It is, however, to be hoped that now this country is under Her Majesty's protection these terrible practices will be put an end to, though it must take time. Punitive measures are all very well in their way, but in a country like Benin the effect would probably be to drive the natives into the bush, and make them greater savages than ever; one cannot reasonably hope to abolish in a short time customs that have been in practice for centuries. The Benin people are free, but are treated as slaves by the king, the title of king's slave being considered an honour.

A man may take unto himself as many wives as he likes. To describe the manners and customs of this strange people would fill a book, but I must say, after all we had heard, we were disappointed in the place. If Dapper and Barbot are to be believed, verily and indeed the glory has departed from Benin city. However, one cannot very well expect to see prosperity going hand in hand with human sacrifices and other barbarous customs. It is almost impossible to conceive that such a deplorable state of affairs should exist in these civilised days, but I assure you I have not told half the horrors I saw and learnt about in the few days spent in that city of skulls.

It might prove interesting to compare the Benin city of to-day with what it was two or three hundred years ago. The Portuguese called it Great Benin. Among the Benin people it is known as Ado, meaning the place where the king lives, whilst the Jakris call it Ubini. According to Dapper the city was surrounded by a high wall, and contained many towers and spires. Nyendale, a Dutchman, would appear to be the best authority on the subject in the seventeenth and eighteenth centuries, he having visited the city on two occasions. He describes the streets as being "prodigious long and broad," and says that the town is "four miles large."

The state of the place to-day is very different, the so-called city

being but a straggling collection of houses, built in clusters here and there, in little or no order. The number of ruins testify to the fact that it was once very much larger; but in our wanderings through the place we saw nothing that suggested "prodigious long and broad streets." The only market-place we saw was on the plain outside the king's residence. The whole aspect seemed to bespeak anything but a prosperous state of affairs. The principal part of the city is the king's residence. This consists of a number of compounds, each surrounded by a high mud wall. In each compound is a fetish shrine, composed of numbers of elephants' tusks, some very beautifully carved, together with a collection of native brass-work, the whole freely besprinkled with blood. After passing through several of these compounds you come to the king's houses, built of red clay, and with nothing particular to recommend them.

In each of the compounds are a number of king's stewards, a brass anklet, and sometimes not even that, being the sum total of their wardrobe. Very few of these functionaries have access to the king's presence, the penalty for passing beyond their own particular compound being death. The king keeps up a good deal of state, only a chosen few being permitted to speak to him direct. He is a very busy personage, attending to all state matters himself. The city is not fortified in any way, the only defence against attack being the natural screen afforded by the impenetrable forest.

The Benin people at one time had the reputation of being great weavers of cloth and workers in metals. They undoubtedly practise these industries now, though we saw nothing of the kind going on during our few days in the place. We saw, however, many specimens of brass ware of very clever workmanship.

In a woodcut in Dapper's work the city is depicted as having hills in the background. These hills certainly do not exist now. The same writer gives the king an army of 100,000 men, including many horsemen. To-day the king has no regular army, only a rabble called his war-men; and a horse is not to be seen in the country. In fact, horses are not be found, according to native testimony, until one is three or four days' march on the other side of Benin city.

As I said before, the manners and customs of the people have apparently changed very little in the last few hundred years, human sacrifices, criminal law, no marriage customs, fetish belief, and general mode of living being to-day as they were in the days of Dapper and Barbot.

I feel I have already somewhat tried your patience, so I will conclude by asking you to overlook the many shortcomings in this my maiden effort.

After the reading of the paper the thanks of the meeting were conveyed t Captain Gallwey by the President.

THE CROSSING OF THE HISPAR PASS.

By W. M. CONWAY.*

ASKOLE, BALTISTAN, KASHMIR.
July 29th, 1892.

TRAVELLERS in the northern regions of the kingdom of Kashmir, who paid attention to the higher mountain districts, reported traditions of the former existence of various ancient passes across the great ridges. These passes are always stated to have been freely used in days more or less remote, but to have been abandoned and become forgotten in recent years, either through insecurity of the roads from raiders, or, in most cases, owing to a reputed change in the condition of the glaciers and an increased accumulation of snow at high elevations. Anyone acquainted with the history of mountaineering will at once perceive a strong analogy between these reports and the statements made to travellers in Switzerland when the real exploration of the Alps began. It was, for instance, reported at Zermatt, in the fifties, that there was in former days a pass over what is known as the Weissthor ridge, which the natives used to cross when they went on pilgrimage to sacred places within what is now the Italian frontier. This old Weissthor pass was stated to have become impassable owing to an accumulation of snow at the top, and it was therefore abandoned. Other old passes shared the same fate, but all were sooner or later rediscovered by the modern generation of mountaineers. The passes across the Hindu Kush and Karakoram ranges will all, no doubt, sooner or later, reveal themselves to properly trained European climbers, and I am happy to be able now to describe the successful passage of two of them.

Native tradition preserved the memory of at least four traversable routes across the main chain of mountains between Rakipushi (near Gilgit) in the west and the Karakoram Pass in the east. There was first the Nushik La, which led from Hispar to Arundu and so to Skardu; second, the Hispar Pass, or Rdzong (meaning "fortress"), from Hispar to Askole; third, the Mustagh Pass from Yarkand to Askole; fourth, the Saltoro Pass from Khapalu to Yarkand. Unsuccessful attempts to cross the first and second of these have been made by Englishmen at different times. Captain Younghusband rediscovered and successfully crossed one of the two Mustagh Passes in 1887, the other of which had been visited, as well as the Nushik La (though not crossed), by that admirable traveller and surveyor Colonel Godwin Austen in 1861. The approaches to the Saltoro Pass have been investi-

* This letter was posted at Skardu on August 9th, 1892, but was not delivered in London till the last days of December.

gated by Lieutenant Molony, R.A., but the pass itself has not been visited.

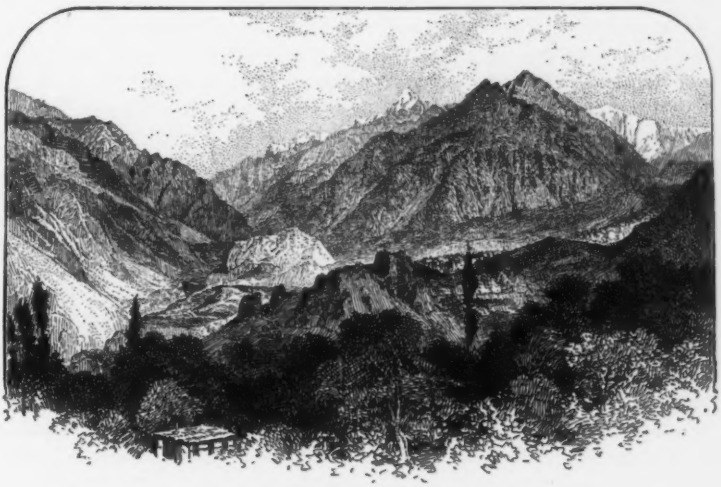
The party which I have the honour to lead, consisting of the Hon. C. G. Bruce (5th Goorkhas), Mr. A. D. McCormick, Mr. J. H. Roudebush, Mr. Eckenstein, and the Alpine guide M. Zurbriggen, having passed through Gilgit and up the Hunza-Nagyr valley, left Nagyr on June 27th to cross the Nushik La and the Rdzong or Hispar Pass. Two miles above Nagyr we came to the foot of the Hopar Glacier and ascended beside it for about 5 miles to a wonderful basin of cultivated fields and rich meadows, in which the five villages of Hopar are situated, enclosed on one side by the glacier and on the other by snowy mountains. Here we found a grand system of glaciers, unmarked on any map, ramifying from the south in all directions, and flowing down from a number of peaks of 20,000 to 24,000 feet in height. I remained eight days in this district for the purpose of making a thorough exploration and map of the glaciers, but as there was great dearth of provisions, I was obliged to send on Messrs Bruce and Eckenstein with two Goorkhas and coolies to cross the Nushik La at once and bring up supplies to meet us on the other side.

Whilst in the Hopar district I attempted the ascent of a peak of 21,500 feet, but after mounting the glacier towards it for 17 miles we found ourselves cut off from the final easy slopes by about 100 yards of impassable ice-fall—a chaos of loose blocks of ice that insecurely covered a series of deep and broad crevasses. Zurbriggen and two Goorkhas worked for hours to force a passage through this place, but had to give up the attempt. We were therefore forced to return and content ourselves with climbing a difficult rock peak of only 17,000 feet, from which however we enjoyed a gorgeous panorama.

We now crossed to the right or north bank of the Hopar Glacier, and then, passing over a ridge about 16,000 feet high, we descended into the Hispar Valley on the other side. We might have mounted the Hispar Valley directly from Nagyr, but it is an absolutely desert trough of rocks, sand, and stones. The *détour* by Hopar is really the quicker route. From the point where we struck the bank of the Hispar stream to Hispar was a distance of about 16 miles; and this was the most horrible piece of walking we had any of us ever experienced. The sun blazed overhead; the thermometer stood at 90° Fahr. in the shade; the bare rocks on either hand concentrated the heat upon us; and the going for most of the way was either wading in sand or striding from one pointed and broken rock to another. The flies made life burdensome, and there was nothing but the muddiest water to drink. As we approached Hispar we had to cross the foot of a steep side valley, whose stream drained some hidden snowy area high above. Just as we reached the brink of the gully we heard a sound like thunder, and saw, advancing downwards at a great rate, a huge black volume of mingled

mud, water, and rocks, which filled the whole gully, and was making for the river below. The rocks that formed the vanguard of this hideous thing were many of them as large as 10-foot cubes, and they were rolled round and round by the mud as though they had been pebbles. In half-an-hour this mud-avalanche was completely passed, and we were essaying to cross the stream, when a second and larger one hove in sight above, and we had to hurry back to escape it. Three times did the mountains disgorge these black monstrosities upon us before we were able to seize a favourable moment to cross the gully that barred our advance.

We spent two days at Hispar, and on one of them I ascended a hill south of the village to try and gain a view towards the great



FOOT OF THE HISPAR GLACIER.

pass. After mounting about 3000 feet I turned a corner by a great stone-man, and was astonished by the view that opened before me. The whole upper stretch of the Hispar Valley was displayed, stretching for some 40 miles, without bend or fold or jutting headland, to the pass at the top, and entirely filled with one vast, even, gently-inclined glacier. The lowest 20 miles of ice were entirely covered with a mantle of moraine. An avenue of mighty peaks walled the glacier in on either hand, and a sombre roof of cloud, at a height of about 22,000 feet, lay motionless over all. The glacier began about a mile above the green fields of Hispar, and beyond that point there was not a visible trace of the presence or activity of man. It was a sight to stimulate any explorer, and I immediately descended with my Goorkha companion,

and made all arrangements to start for the pass on the following morning (July 11th).

What with the badness of the stony way, the unwillingness of the coolies, and the many necessary halts for surveying and collecting, our first three marches up the glacier were short. The same distance was accomplished by our lightlier burdened and hungrier predecessors, Messrs. Bruce and Eckenstein, in two days. We thus reached an Alp and camping ground, called Haigutum, on the left bank of the glacier, and something less than half-way up it towards the pass at the glacier's head. Haigutum is an important point on the route, for here a short side glacier (the Haigutum Gamu or glacier) joins the main stream from the south. At the head of the Haigutum glacier is the Nushik La; at the head of the main glacier is the Hispar Pass. It was my intention on the following day to have ascended to the top of the Nushik La, but, as clouds enveloped the glacier and snow fell with much persistence, the expedition would have been valueless. Let me, therefore, briefly describe the adventures of my companions in the passage of this pass.

Messrs. Bruce and Eckenstein, with their followers, after having been stopped at Haigutum for two days by a snowstorm that lasted forty hours, started on July 4th to cross the Nushik La. Their party consisted of fifteen men and a dog; amongst the men was one Shersi of Hispar, who said he had crossed the pass in his youth. I now quote from Mr. Eckenstein's diary:—

"We started at 4.15 A.M. in beautifully clear weather. The way went first along the top of the old moraine (on the end of which Haigutum is situated) and then down to the Haigutum glacier, which is reached in ten minutes. This is crossed diagonally in half an hour to the foot of the slope opposite (*i.e.* the north-west slope of the mountain east of the pass), which is struck at a point considerably to the left of and below the pass, the part below the pass being steep and raked by avalanches. From here to the top of the pass took four hours and a half. The whole way up is on steep snow-slopes, cut up by many *schrunds*, and it is impossible to go without traversing some places where there is danger from falling ice. The slope is of a considerable average steepness, the bit which was steepest (about 150 feet high) being at an angle of 52½°. Bruce, the two Goorkhas and old Shersi went roped together in front, and I brought up the rear. The dog acted like a true mountaineer. When the slope got too steep for him to run about on, he gave up frolicking around, and followed soberly and properly in the steps. At the beginning the snow was somewhat soft, and for a short time unpleasantly so. Our progress was regular and uneventful for rather more than half-way up. The place we then got to presented two alternatives; either to go over a *schrund viâ* a very shady snow-bridge, which would have been followed by a fair snow-slope; or to avoid the

schrund by going to the right. This was very much the more direct way, but involved going up the steep slope mentioned above, and a slip on this would certainly have been fatal, as it terminated in an ice-precipice below. The slope was ice underneath, covered by about a foot of not over-good snow. I abstained from saying anything, and asked Bruce to let the natives settle it between themselves, and their subsequent performance proved full of interest. Two of them put down their loads and took off the goat-hair rope they use for carrying. They took a double length of this, and one tied it round his waist in true orthodox style. They then borrowed one of our axes (which so far had not been used). The first man (who was tied round the waist) started ahead with the axe, cutting steps, followed by the second man, who held the two ends of the doubled rope tied round his stick, which he drove in as he went along. And so they went along till the easier slope above was reached. Then the others followed, and subsequently three went back to bring up the two loads that had been left behind. It was really a capital performance, and would have done credit to any men. Altogether their performance, and that of the other five natives as well, was one that not every Swiss guide would care to imitate under similar conditions. None of the loads were much above 30 lbs., but were all arranged to be inside this limit as far as possible. Just below the top of the pass there was a rather nasty piece of slope, with snow that was very rotten. Our natives all stopped, and each said his prayers before going on to it. The top was all corniced, and we did not go over quite the lowest point of the pass, but at a point about 50 feet higher to the east. Amar Sing and Parbir (the two Goorkhas) cut through the cornice, the passage of which required the use of the rope in the case of every member of the party. We reached the top at 9.40 a.m., and the view from there is truly splendid."

The descent to Arundu is perfectly easy and straightforward, and does not need description, for it has been admirably described by Colonel Godwin-Austen in the *Journal* of the Royal Geographical Society for 1864.

When we reached Haigutum we had still a certain amount of baggage and some servants that could be dispensed with, so we arranged to send the whole over the Nushik La to Skardu, in charge of Mr. Roudebush. Zurbriggen was to accompany the party for two marches, and then return and join me again on the Hispar glacier. The party under the command of Mr. Roudebush crossed the pass in bad weather on July 14th. They also had a local guide with them, but neither guide nor coolies showed the least mountaineering ability. At first they took the same route as Mr. Bruce, to the far side of the Haigutum glacier; but then Zurbriggen declined to follow the local guide, who, like Shersi, was for leading them under some dangerous overhanging ice, which might have fallen upon them at any moment. Zurbriggen struck out a

safe route more to the left and reached the watershed, in three hours and a quarter of actual climbing, at a point about half a mile east and 500 feet or more higher than the point where Mr. Bruce's party crossed. He had infinite trouble with the coolies, who kept on throwing down their loads and refusing to advance. Again and again he had to go down and help the men up, one by one, which he did with the greatest kindness. The coolies fully realised the value of his help, and when all the difficulties were over, they fell on the ground and kissed his feet, saying that thenceforward they would follow wherever he chose to lead. One of these men returned with Zurbriggen to my party, and his account of what had happened stimulated the courage of my coolies, who thenceforward ceased to give trouble and worked admirably and without complaint.

Zurbriggen was away from me for three days in all. During one of these days we remained stationary. On the other two we made long marches up the glacier, the surface of which was now free from stones, except for two or three big medial moraines. Our advance was by no means easy, for the glacier was often crevassed and always cut up by large sinuous streams, far too wide to be jumped, which undercut one side of their bed. We had to meander around the curves of these waters, often finding it difficult to discover a route. On the evening of July 16th we encamped at the edge of the upper snow-field, and at the angle of a great icy affluent, flowing in from the south, at whose head stood a mighty white mountain, so graceful in form, and pure in aspect, that I named it the White Lily. Shortly after camp was pitched we heard Zurbriggen's whistle coming from far over the glacier, and in due time he arrived from his laborious march.

The next day Zurbriggen rested, and we took rounds of angles with the theodolite, catalogued collections, inked in the map, and engaged in other needful occupations. On July 18th we started, meaning to make a camp at the foot of the final ascent of the pass. The coolies, led by a Goorkha, went up the right side of the glacier; M'Cormick, Zurbriggen, and I, with the other Goorkha, struck straight across the ice to the other side, in order to reach certain points necessary for the survey. As we went along we found the snow to be in admirable condition; the day was so superbly fine that we loudly bewailed our failure to arrange for pushing on at once over the pass. Just then we saw that the crevasses at the foot of a side glacier were forcing the coolies out into the middle of the ice and within shouting distance of us. In a moment I determined to change our plans, and signalled for all the men to come in our direction. We started at once up the long snow slopes towards the col, and walked at a rapid pace. Zurbriggen led skilfully through a labyrinth of great crevasses that presently intervened, and then we had to pound over some 4 miles of gently sloping snow-field to the pass. At noon we were all united on

the summit, and the longed-for view over the other side disclosed itself to us.

It is a view unique in my experience of mountains. We saw no series of ridges, and looked down no long glacier such as we had expected to behold. Instead of these things there was displayed beneath us a vast, seemingly flat lake of snow, in area at least 300 square miles, white, silent, the very embodiment of stillness and calm. A great range of peaks ringed it around, and a mighty group of rock-needles jutted into the heavens on one side of it to a height of 24,000 feet, masses of rock surpassing the Aiguilles of Chamonix in number, in steepness, and immeasurably in size. There was no visible outlet to this lake, but there was a suggestion of the existence of one round the corner to the right, hidden by a near snowy ridge. We feared that there would prove to be a great ice-fall at this point, and the reported "accumulation of snow" might well enough have resulted in making an ice-fall, of such dimensions as this would necessarily possess, wholly impassable. We stopped for an hour and a quarter on the pass, during which time we lunched. I took a round of angles and read the instruments. The mercury stood at 15·85 inches. The air temperature was 64°. Many of us felt, though none suffered from, the diminished atmospheric pressure, but the burning heat of the sun in the morning gave us headaches, which the diminished pressure may have increased. The headache, however, was primarily one of the sun-headaches with which we have become far too familiar.

It was not without some misgiving that I gave the word to descend. We went down a gentle snow-slope, and then through a maze of big crevasses, thus reaching the edge of a bay of the great snow-lake. We traversed this and passed round its far angle to the right. There, as we turned the corner, the broad smooth highway of the Biafo glacier opened suddenly before us, stretching away far as the eye could reach, without visible crease or chasm in the direction we must go. On either hand peaks of extraordinary abruptness, to which the mountains of Europe contain no parallel, rose one behind another in interminable array. Far in the distance clouds and glacier seemed to meet in purple indistinctness. Just round this corner, for us so momentous, we found a plateau suitable for the camp; there we spent the night. Hour after hour snow fell deep upon us, and the clouds wrapped us around, but in the morning the weather lifted somewhat, and we were able to continue our way. We marched about 12 miles before camping at nightfall in the bed of an old lake.

The glacier was without crevasses for the whole distance, a most disagreeable condition of things, for there was no crack for the melted snow to flow into, and it lay about all over the surface of the ice and turned it into slush. We waded for hours through this nameless compound of water, ice, and snow, which sometimes reached to the

knee. Imagination cannot picture a greater satisfaction than we felt when we once more trod on earth that was partially dry. The next day we made another long march, and came in the evening to a reasonably comfortable level, where there was brushwood to burn and grass to lie upon. On the following morning I sent off Zurbriggen and the spare coolies to Askole, about 25 miles down. They reached the village in the evening by a long forced march. M'Cormick and I remained all day resting in camp, and spent the day following in sketching and surveying. The weather now became steadily bad, and my survey could proceed but slowly, owing to the constant clouding of the peaks and their intricacies of form. We were thus unable to reach Askole with a finished map till four more days had passed; but ultimately all our work was satisfactorily done, and on July 26th our whole party (with the exception of Mr. Roudebush, who remained at Skardu) was reunited at Askole.

The Hispar Pass is thus from the end of the Hispar Glacier to the end of the Biafo Glacier over 80 miles in length, and is the longest glacier pass in the world outside of the Arctic regions. At Nagyr everyone declared that it had not been crossed in the memory of any living person, and it was evident enough that none of the men that accompanied us had the least knowledge of the way, for they were all as surprised as we were at the unexpected nature of the view from the col. At Askole, however, I was able to learn some more precise traditions from the mouths of the Baltis. Colonel Godwin-Austen, writing in 1864, says of the Hispar Pass, "It was by this way that the Nagyr men used to come into the Braldoh and loot the villages; their last raid was some twenty-four years since (*i.e.* about 1840), when a body of from seven hundred to eight hundred crossed over, and carried off about one hundred men and women, together with all the cows, sheep, and goats, they could collect." I enquired about this story every day I was in Askole and was informed as follows:—The last time there is any memory of the pass having been crossed was in the days of the father of the very old man in whose house our baggage was stowed. He does not remember the event, but he remembers his father telling him about it. The leader of the band that crossed from Nagyr was Wazir Hollo. They came late in the year, three months later than now. The harvest in Nagyr had been bad and the Nagyr folk needed provisions. The band did not attempt to attack Askole, said the old man, but the Baltis gave them ibex skins and flour. The Nagyr people invited some of the Baltis to go back with them, but they refused, fearing the cold. The Nagyr men started to return by the way they had come, but they all perished in the snow except Wazir Hollo, who alone reached home to tell the tale. There is perhaps a fragment or two of truth in this story, but the actual facts will probably never be discovered.

MENDEZ PINTO.

By STEPHEN WHEELER.

MISTRESS DOROTHY OSBORNE found entertainment in the travels of Ferdinand Mendez Pinto—"'tis as diverting a book of the kind," she tells Sir William Temple, "as ever I read;" but more serious critics must often have been tempted to throw aside his narrative in despair. Dates and names of places appear to have been scattered about the pages at haphazard. Small wonder that Cervantes called him a liar. Moreover, Mendez Pinto writes himself down a blustering rogue and cut-throat in prosperity, a poltroon when the odds were against him. We get a clear indication of his character in the account given of his visit to Kwedda, a small state in the Malay peninsula. He had sailed thither in company with a Mohamedan factor. This unfortunate man, at a feast to which he was bidden by a brother Moslem, spoke ill of the Raja, who, on hearing of it, ordered both host and guest to be seized and put to death. Their hands, feet, and lastly their heads were sawn off. Mendez Pinto was in an agony of terror. "Like one distraught of my wits," he says, "I cast myself at the feet of the elephant whereupon the king rode, and with tears in my eyes cried out, 'O sir, have pity on me, and take me for thy slave rather than cause me to end my days with the torments which have taken those out of the world whom I see here.'" He asserted that he was nephew to Dom Petro de Faria, which was a lie; and furthermore, by way of propitiating the king, vowed that Dom Petro would be vastly pleased at the execution of the factor, a dog who had embezzled the goods committed to his charge. This was another lie, invented, says Pinto, upon the sudden, "and not knowing well what I said."

Evil deeds were wrought by the adventurers in whose service Mendez Pinto sailed the Eastern seas. Antonio de Faria, perhaps the ablest of his commanders, was great at surprises; at taking the enemy—that is, anyone weaker than himself—unawares. We read of his boarding a junk and flinging four pots of gunpowder among the rascals asleep upon the hatches, which made them all leap into the sea. Nine or ten were drowned, but the others were rescued and pressed for sailors. We read again of the vanquished dying in torments like mad dogs. Even little boys and old men were tortured. Captives were put to death "by making their brains flye out of their heads with a cord." When the Portuguese sacked and burnt the town of Nouday, in Southern China, it was great pity, says Pinto, to behold a number of handsome maids led away, tied four and five together, weeping and lamenting. When they treacherously laid hands on a bride who had come to De Faria's ship, believing that her newly-married husband was on board, Pinto only recollects the humorous side of the incident. His account of the burning of a village in the Island of Hainan may also be quoted.

One house was filled with sick and wounded. The poor creatures begged for mercy; but Antonio de Faria would by no means hearken unto them. "It would have moved any man to pity," Pinto declares, "to hear the lamentable cries made by the wretches within, and to see them cast themselves headlong out of the windows, where our men received them upon their pikes and halberds."

Ferdinand Mendez Pinto sailed for the Indies in March, 1537, "meanly accommodated," but thinking it the best way to free himself from his poverty. He had recently been in the household of a Portuguese grandee, waiting on him in his chamber, so we may infer that he embarked in some subordinate capacity, either as a body-servant or a soldier. But as Tavernier tells us, every Portuguese became a hidalgo directly he passed the Cape of Good Hope. Plain Jeronimos and Pedros straightway prefixed "Dom" to their names; and, according to the Baron, common soldiers stood as fair a chance of becoming wealthy as governors. From the time of his arrival at Diu till he returned to Lisbon some twenty years afterwards, Pinto's life was a series of adventures by sea and land, each more exciting than the last. When his ship reached Diu, the Portuguese garrison were expecting to be attacked by a fleet from Egypt, equipped by the Pasha of Grand Cairo, in obedience to orders from the Sultan of Constantinople, to whom the Sultan of Gujarat had appealed for help against the Europeans. Pinto now went with a couple of small ships which sailed for the Red Sea to get intelligence as to the Pasha's designs and preparations. From Massowa he was sent inland with a party taking letters to a Portuguese agent at the court of the King of Abyssinia. He thus traversed "the Empire of Negus to his utmost port Ercoco,"* or as Pinto spells it, Arquico. On the way back he was wrecked near Aden and taken prisoner by the Arabs. They sold him as a slave; but he was lucky enough to fall into the hands of a Jew who, for a consideration, handed him over to the Portuguese at Ormuz, whence he found his way to Goa.

Pinto next took service under the Captain-elect of Malacca, with whom he sailed for Further India. From Malacca he was sent on a political mission to Sumatra, and having discharged this duty to the satisfaction of the Captain, was afterwards employed on a similar mission to some petty rajahs on the eastern coast of the Malayan Peninsula. He next fell in with Antonio de Faria, half trader, half pirate, under whom he sailed to Siam, Tonkin, and China.

The kind of enterprise Mendez Pinto was now engaged in has already been described. At Liampo, the modern Ningpo, where the Portuguese had a settlement, Antonio de Faria was received with every possible demonstration of respect. The adventurers attended mass at the church and listened to a sermon in praise of Antonio de Faria, "but

* 'Paradise Lost,' xi. 397.

that in words so ill-placed and so far from the text that our Captain was much ashamed at it." A fastidious and dogmatical pirate. Then came a banquet at the town-hall, where De Faria was served by eight maidens, exceeding fair and comely, and attired like mermaids. These young ladies were the daughters of worthy merchants who wished to do him honour. The festivities ended with a bull-fight.

It was at Liampo that De Faria first heard of the island of Calempuy. A Chinese pilot told him that in this island were buried, in tombs or coffins of gold, seventeen Kings of China; that here also might be found a vast number of golden idols and such other immense treasures, Pinto writes, "as I dare not deliver for fear of not being credited." Being inquisitive by nature and withal ambitious, De Faria resolved to set out for the island of Calempuy without delay. Geographers have still to ascertain the latitude and longitude of Calempuy. Here is an extract from Pinto's description of the place:—

"This Island was all inclosed with a platform of Jasper, six and twenty spans high, the stones whereof were so neatly wrought, and joyned together, that the wall seemed to be all of one piece, at which everyone greatly marvelled, as having never seen anything till then, either in the *Indiaes*, or elsewhere, that merited comparison with it; this Wall was six and twenty spans deep from the bottom of the River to the Superficies of the water, so that the full height of it was two and fifty spans. Furthermore the top of the Platform was bordered with the same stone, cut into great Tower-work; upon this wall, which environed the whole Island, was a Gallery of Balisters of turned Copper, that from six to six fathom joyned to certain Pillars of the same Metal, upon each of the which was the figure of a Woman holding a bowl in her hand; within this gallery were divers Monsters cast in metal, standing all in a row, which holding one another by the hand in manner of a dance incompassed the whole Island, being, as I have said, a league about."

A writer in the *Encyclopædia Britannica* states that Calempuy was near Pekin. I should be inclined to search for the island up the Yang-tse; or it may be P'u-to, east of Chusan, a famous place of pilgrimage, dedicated by the Buddhists to Kwan-shi-yin. But, wherever it was, the Portuguese found their way there and proceeded to rifle the royal tombs. The work of plunder, however, had only just begun when the guardians of the temple gave the alarm, and the baffled Portuguese had to fly for their lives, Antonio de Faria "tearing his hair and beard for very rage, to see that through his negligence and indiscretion he had lost the fairest occasion that ever he should be able to meet withal."

Shortly after this adventure, Pinto was once again shipwrecked; and we now come to the most striking episode in his reminiscences. For after divers mishaps, he and some twelve or more of his band were seized by the Chinese and taken to Nankin, whence they were presently sent first to Pekin—Milton's 'Paquin of Sinæan Kings'—and afterwards to Quinsay, not the noble city of that name described by Marco Polo, but some town, apparently, nearer to the northern capital. At this time, that

is to say about the middle of the sixteenth century, the dynasty founded by the Mings, who some years earlier had expelled the feeble descendants of Khublai Khan, was now itself threatened by approaching dissolution. Within the next fifty years it was to be displaced by the Manchus; but in Pinto's day the chief danger was from another quarter. At the end of the fifteenth century, Dayan Khan, descended from Khublai and Jenghis Khan, had once more united the Mongol nation. For upwards of fifty years he seems to have possessed supreme authority. On his death, however, the Mongols again became divided, various sections being ruled by one or other of his sons and their descendants. Of these, Altan Khan, chief of the Tumeds, became famous. He was a grandson of Dayan Khan; and besides being chief of the Tumeds, he was virtually leader of a confederacy which included two other sections. His own tribe, the Tumeds, lived and still live near the great bend made by the Hoang-ho, or Yellow River; being adjacent to the country of the Ordus through which the Abbé Huc, and recently, the Russian explorer, M. Potanin, travelled. Most of Altan Khan's life was spent in wars with the Ming emperors of China. "Never," says Moyria de Maillac, "had the Tartars so much harassed the Chinese as under his leadership." He first attacked them in 1529, and invaded their country at intervals down to the year 1556. A full account of Altan Khan and all that he did, will be found in Sir H. Howorth's 'History of the Mongols.' It was in Altan Khan's time, and mainly by his influence, that the Mongols were converted to Buddhism as it now prevails in Mongolia.

We know from history, that in the year 1544 Altan Khan entered the province of Pe-Cheli, and advanced almost to the gates of Pekin, ravaging everywhere. In 1549 he suffered a reverse, but the next year again advanced to the capital. Whilst Pinto and his fellow-captives were at Quinsay—the date he himself gives is July 3rd, 1544—news came that the King of Tartary had fallen upon the city of Pekin with 1,800,000 men, whereof 600,000 were horse, with 40,000 "rhinocerots" that drew the waggons wherein was the baggage of the army. For "rhinocerots" we must no doubt read "camels," and the strength of the Tartar king's army is assuredly exaggerated; but, unless Pinto's dates are altogether and hopelessly wrong, we may safely conclude that it is Altan Khan, chief of the Tumeds, of whom he is speaking. It could not possibly have been, as Professor Vambery suggests, in an introduction to an abridged reprint of Pinto's 'Voyages,' Nurhachu, the Manchu chief, who was not born till some years afterwards. One division of the Tartar host presently laid siege to Quinsay, and battering down the gates with iron rams, carried the place by assault. "Thus did these barbarians possess themselves of this miserable town, whereof they put all the inhabitants they could meet withall to the sword, without sparing any; and it was said that the number of the slain amounted to

60,000 persons, amongst whom were many women, and maids of very great beauty, which appertained to the chiefest lords of the place."

Pinto and his companions were more fortunate. Their lives were spared and they were taken to the Tartar king's headquarters before Pekin. Here they were summoned to his presence. Altan Khan was "about forty years of age, full stature, somewhat lean, of good aspect; his beard was very short, his mustaches after the Turkish manner, his eyes like to the Chineses, and his countenance severe and majestical."

Unable to capture Pekin the Tartars retired, taking Pinto and his companions with them. Recrossing the Great Wall and embarking, apparently, on the Hoang-ho, they came first to Lancama and afterwards to Tuymican. Lancama is elsewhere referred to by Pinto as the city where "Tamberlain, king of the Tartarians," usually kept his court, but Timur,

> "The mighty Tamurlane,
> That was lord of all the land
> Between Thrace and Samarcand."

flourished two hundred years earlier, and never came so far eastward. It must have been some other Timur who kept his court at Lancama. Altan Khan's capital, according to Pinto, was at Tuymican. Hither came ambassadors from six great and mighty monarchs, namely, Xataanas, the Sophy of Persia, the Emperor of the Yueos, whose country borders on that of Bramaa (Burma) and Tanguu (Tonghoo); the Calaminham, a more or less fabulous potentate, Sir Henry Yule says, in the interior of Indo-China; the Great Moghul; and the Emperor of Caran. Xataanas, the Sophy of Persia—Milton's 'Bactrian Sophy'—must be Shah Tamasp, the Suffavi King of Persia. Elsewhere Pinto says that he alone of all foreigners was allowed to buy the fine porcelain of Nankin. The Emperor of Caran is not so easy to identify. On the borders of his kingdom, Pinto tells us, there dwelt a people whom they of the country called Muscovites—"men of fair complexion, well-shapen, and apparelled with breeches, cassocks, and hats like to the Flemings which we see in Europe."

Altan Khan presently allowed the Portuguese to go away with an ambassador whom he was sending to the King of Cochin China. The description of the journey is most interesting. They had reached the country of the Tumed Mongols from Pekin, and were now to travel southwards through the borderlands of China and Tibet to the Gulf of Tonking. Marco Polo has described the journey from Pekin to Tibet; the Abbé Huc went this way to Lassa; Prejevalsky has explored the country round Kokonor; the route has been crossed by several travellers ascending the Yang-tse-Kiang; a French expedition ascending the Mekong reached Yunnan, and only lately M. Bonvalot and Prince Henri d'Orleans, reaching south-eastern Tibet from Lob Nor, have found their way, *viâ* Batang, Ta-tsien-lu, and Yunnan, to Tonkin.

The exact route followed by Pinto has never been traced. Starting from Tuymican, which was probably not very far from the lake Koko-Nor, he seems to have reached the upper waters of one of the great rivers which take their rise in the eastern plateau of Tibet, the Yang-tse-kiang or the Mekong or the Salween. After descending the river for some distance, the travellers must have struck across the mountains to the valley of the Songkoi, the Red River of Tonkin. One of the first places they came to after leaving Tuymican was a fortified town which Pinto calls Puxanguim. The defences included "cannons of wood made like to the pumps of ships, behind which they put boxes of iron that held their charge and were fastened unto them with iron bands." The Portuguese asked who it was that had fashioned this primitive form of breech-loader, and were told that "certain men called Almains, and of a country named Muscovy" were the inventors. They had come thither in company with a widow lady of a place called Gaytor, who had been chased out of her country by a king of Denmark. This is a curious story. De Mendoza in his 'History of China,' published in 1585, observes that the Chinese had the use of artillery long before any European nation. "The first beginning," he goes on to say, "was in the yeare 1330 by the industrie of an Almane, ... but the Chinos saie, and it is evidently seene, that this Almane dooth not deserve the name of the first inventor, but of the discoverer, for that they were the first inventors."

At a very fair town called Quanginau, the travellers halted three days, in order to see the festivities that were held to celebrate the entry of the Talapicor of Echuna, or Lechuna, as the name is elsewhere spelt, who was going unto the Tartar king "to comfort him about the ill-success he had had in China." The Talapicor, says Pinto, is their Pope; and one is tempted to believe that he may have been no other than an early incarnation of the hierarch now known as the Dalai Lama of Lassa. Sir Henry Howorth tells us that the third Dalai Lama visited Altan Khan in the year 1577. The Talapicor preached at the pagoda attached to a Lamaist nunnery at Quanginau, "delivering a world of extravagancies and fooleries," and Pinto actually gives us an extract from his sermon.

Fourteen days after leaving Quanginau, Pinto and his companions came to Lechuna itself, "the chiefest city of the religion of these Gentiles, and such it may be as Rome is amongst us." Here there was a very sumptuous temple wherein were the tombs of seven-and-twenty emperors of this monarchy of Tartary. A short distance from the temple was an enclosure containing two hundred and eighty monasteries, wherein were numerous pillars of brass surmounted by an idol of the same metal. "These idols are the statues of them whom in their false sect they hold for saints, and of whom they recount such fopperies as would make a man wonder to hear them." The word "Lechuna" may

be only the Tibetan *Lha-Khang*, a temple; but it seems quite possible that Pinto may have visited Lassa. Friar Odoric of Pordenone was there in the early part of the fourteenth century; and the Fathers Grueber and Dorville reached Lassa from Pekin in 1661.

We now come to what from a geographical point of view is one of the most remarkable of Pinto's stories. He states that some time after leaving Lechuna he arrived at the lake of Singapamor, "an admirable masterpiece which Nature hath opened in the heart of this country." From Singapamor flowed four very deep and large rivers. Innumerable disquisitions have been written on the hydrography of Tibet. The following passage is from the account of M. Bonvalot's expedition—

"Nous avons atteint le sommet de l'ancien monde, c'est sous nos pieds que ses grands fleuves prennent leur source. Les glaciers que nous découvrons envoient leurs eaux d'un côté à l'Océan Indien, par la Salouen [our Salween] le Mékong, et de l'autre, aux mers de Chine par le Yang-tse. . . . Et lorsque nous découvrons ces lacs immenses, encore complètement inconnus, ou que nous baptisons ces châines colossales, il nous semble que nous violons quelque sanctuaire."

What seemed to Pinto Nature's admirable masterpiece is to the French traveller an inviolable sanctuary. The Salween is Pinto's "Jangumaa," which enters the sea by the bar of Martaban. Jangumaa is not a bad transliteration of Giama Nu, which is one of the names given by the Tibetans to the upper waters of the Salween. The Mekong or river of Cambodia is Pinto's Ventrau or Ventinau, which runs through Siam and enters the sea by the bar of Chiamba. Of the other rivers which, according to his theory flowed from Lake Singapamor, one he thinks might be the Ganges. As Sir Henry Yule observes, the idea of great rivers radiating from a central lake repeatedly occurs in the writings of the early travellers. In the 17th century, Father Henry Roth, who had been attached to the Jesuit mission in India, told Kirchen that, among the snowy mountains of Tibet, there was a vast lake from which the Ganges, the Indus, the Ravi and the Athek (? Attock or Kabul river) derived their sources.

When Pinto reached the country which he calls Cauchenchina, the king had recently gained a victory over the Tinocouhos. This must refer to the civil war between the ruler of Tonkin and the chief of Tenchoa or Tingiva. For the history of Tonkin during this period, we have the narrative of Christopher Borri, an Italian Jesuit, and 'A Description of Tonqueen,' by S. Baron, who, according to old records quoted by Sir Henry Yule, was born in the country, "his grandfather by the father's side a Scotchman, his father a Dutchman, and his mother of the race of Portugalls." The reference is necessary to show that Pinto reached the Gulf of Tonkin near the mouth of the Songkoi River.

Here his journey across Asia overland came to an end; and his subsequent adventures, including two voyages to Japan, must be left to

some other commentator. But even from this brief summary of his earlier wanderings, it may be seen that his book throws a curious light on the mediæval geography of Asia, and in particular helps us to understand how the Portuguese at one time seemed to "hold the gorgeous East in fee," and how, as an old geographer says, "their insufferable pride and insolence brought on their destruction." Their settlements at Goa and Macao alone remain to attest their former dominion in the Eastern seas.

THE RUINS IN MASHONALAND.*

By HENRY SCHLICHTER, Ph.D.

THE outlines of Mr. Bent's discoveries in Mashonaland have already appeared in last year's *Proceedings*, R.G.S. From Mauch's discovery of the great ruins of Zimbabwe in 1871, up to Bent's expedition, no material addition to our knowledge of these mysterious buildings has been made, and Mr. Bent's explorations are therefore of the greatest interest to geographers as well as to archæologists.

The question at what time and by what people these buildings were erected, is not merely one concerning the historical geography of Africa, but is of the utmost importance for the determination of the limits of the world as known to the ancients. Carl Ritter correctly remarked that these ruins (which were known to the Portuguese by hearsay long ago) would become the link for comparing modern and ancient geography. The 'Periplus of the Erythræan Sea' and Ptolemy—the two principal authorities on the ancient geography of Eastern Equatorial Africa—describe the territories south of the Zanzibar coast as almost entirely unexplored, and the other still extant Greek and Roman geographers knew nothing of a foreign colony in South-east Africa. On the other hand, it was clear from the outset that the buildings could not possibly have been erected by African savages. Bent's investigations led him to the conclusion that the ruins are of Arabian and pre-Mohamedan origin, and that the object of this old colonisation was the exploitation of the rich gold-fields of the country. Many indications of a strange stone- and nature-worship were found entirely analogous to the cults which were in ancient times practised in Arabia and the surrounding regions.

The most interesting feature of the Zimbabwe ruins, the great conical tower, is closely connected herewith, and Mr. Bent recognises the keynote of the worship which was practised at Zimbabwe in a most important

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* 'The Ruined Cities of Mashonaland.' Being a record of excavation and exploration in 1891, by J. Theodore Bent. With a chapter on the Orientation and Mensuration of the Temples, by R. M. W. Swan. London, Longmans, Green & Co., 1892: 8vo. pp. xii. and 376.

passage of Montfaucon, in which it is stated that the ancients assure us that all the Arabians worshipped a tower. Moreover, numerous monoliths, decorated soapstone beams, soapstone birds on long pedestals, etc., etc., afford further evidence of this worship. This kind of stone- and nature-worship is so entirely antagonistic to Mohamedanism, that Mr. Bent's conclusion is inevitable—that the ruins can date only from a pre-Mohamedan period. But these ruins represent not only temples and places of worship, but also fortifications; and probably this was the first and original purpose of most of them. High and carefully-built granite walls, small entrances, narrow passages, and many interior walls and traverses are proof of this, as is also the fact that the buildings were erected on strategically well-selected sites. There can be no doubt that the foreign invaders built these strongholds, and occupied the country on account of its richness in gold.

The smelting furnace, the crucibles, the blowpipes, and the casings, which Mr. Bent discovered within the precincts of the hill-fortress of Zimbabwe, are direct evidence of this; and what enormous quantities of gold must have been produced by these ancient colonists may be judged of from the very great number of old workings, shafts, crushing stones, etc., which are found in the Mazoe Valley, at Hartley Hills, on the 'Mswézwe River, at Fort Victoria, and at many other places of Mashonaland. Mr. Bent states that wherever the pioneer prospectors have as yet penetrated, overwhelming proof of the extent of the ancient industry is brought to light. His other discoveries as to this old Arabian colony are not less interesting. The soapstone birds, already mentioned, represent hawks or vultures, and Mr. Bent points out that similar birds were sacred to Astarte among the Phœnicians, and are often represented as perched on her shrines. Many phalli and several decorated soapstone beams were found; one of the latter, which stood on an elevated platform on the western part of Zimbabwe Hill, was more than 11 feet in length. This soapstone beam is covered with well-executed geometrical patterns, and in the middle of it there is, curiously enough, the same chevron pattern with which the south-eastern wall of the great circular ruin is decorated. This pattern only runs round a portion of the beam, and Mr. Bent thinks that it may possibly have been used for the orientation of the pillar towards the setting sun. Moreover, a collection of stones of different geological origin and entirely foreign to the place was discovered on Zimbabwe Hill. All these finds prove of what importance this stone-cult was to the ancient colonists. Mr. Bent quotes Masudi, who alludes to the ancient stone-worship of Arabia as having at one time formed a part of the natural religion of the Semitic races. That the people who founded and originally inhabited this colony were not without artistic taste is evident from the fragments of decorated soapstone bowls which Mr. Bent unearthed. Bulls, zebras, baboons, and other animals are well depicted; and on one of the

fragments is represented a native hunter who shows quite distinctly the characteristic Hottentot steatopygy. This is of importance for two reasons: firstly, as a proof that Hottentots were at that time among the inhabitants of these eastern regions, and secondly, because on the monuments of Deir-el-Bahari—where, as is well known, an Egyptian naval expedition of the 17th century B.C. is described in word and picture—two African natives are depicted who show exactly the same Hottentot steatopygy.

Little importance can be attached to some indistinct lines which Mr. Bent considers himself justified in regarding as a fragment of an inscription. He admits that this lettering is "provokingly fragmentary," and it is impossible to draw any reliable conclusions from so very slight an evidence.

One of Mr. Bent's most interesting finds at Zimbabwe is that of a soapstone ingot mould, very similar in shape to an ingot of tin which was found in Falmouth Harbour, the latter being undoubtedly of Phœnician origin. This is a very curious coincidence. Did the gold-workers of ancient Zimbabwe work for the Phœnician market? Had the Phœnicians some influence not only on the industry, but also on the religion, customs, architecture, and art of these ancient colonists? It is impossible to answer these questions at the present time, but various comparative remarks which the volume contains seem to favour such assumptions. Moreover, we know that early in antiquity Phœnician navigators sailed from the northern end of the Red Sea to the unknown South. The possibility of Phœnician influence at Zimbabwe can therefore not be denied, and further investigations will doubtless throw light on this highly important question.

Mr. Bent's remarks on the ancient geography of the east coast of Africa are in some respects open to criticism. Neither did Ptolemy obtain his "provokingly vague information" from "a merchant of Arabia Felix," nor is Prasum the farthest point mentioned in the 'Periplus.' It is sufficient to read the seventeenth chapter of Ptolemy's first book of geography to see that the former statements are incorrect; and as regards Cape Prasum, it was entirely unknown to the author of the 'Periplus.' Another questionable statement is that our authorities are not only meagre, but that they were men who had no practical knowledge of the subject, and who knew next to nothing of the vast extent of commercial operations which were going on outside the limits of the Red Sea. To refute this, it is sufficient to say that the most important work on the commerce and navigation of the ancients in the Indian Ocean, viz., 'The Periplus of the Erythræan Sea,' was written by a man who was himself a navigator and a merchant, and who was well acquainted with the Asiatic and African shores of the Indian Ocean as far as to India and to the Zanzibar coast. The conclusion at which Mr. Bent arrives, viz., "that the waters of East Africa were known only

to the Greeks and Romans vaguely through a Phœnician and Arabian source," does not seem to be well founded, as a perusal of Ptolemy and of the 'Periplus' shows; but we need not go into details, as this question has already been discussed by Heeren, Mannert, Malte-Brun, Forbiger, and several others.*

The remarks which Mr. Bent's companion, Mr. Swan, has contributed to the book do not strike us as furnishing the true key to the plans of the ruins. It is evident that the peculiar wall decorations of Zimbabwe are in some way connected with the daily and yearly motion of the sun; but a glance at the plan of the great circular ruin suggests a doubt regarding the statement that at the ends of the chevron pattern (around the outside of the wall) the rays of the sun are nearly tangential to the wall, so that all parts of the wall, and those parts only which receive the direct rays of the sun when rising at the summer solstice, are decorated by this symbolical pattern (see p. 135). Moreover, no altar was found in the middle of the great ruin, and the travellers only "imagined" (see p. 101), by comparison with the temples on the hill, that such an altar might have existed. This altar should not therefore have been conspicuously put down in the plan, and Mr. Swan was hardly justified in basing two statements of the highest importance—viz., the bearing of the rising sun at the summer solstice in its relation to the sacred enclosure, and the assumed observations of meridian transits of stars—on the existence of this problematical altar.

The examination of the Zimbabwe ruins forms the principal part of the subject-matter of the volume, but it also contains a good description of the present state of Mashonaland. A number of careful ethnological observations, many remarks on climate, soil, and productions, and an interesting account about the road and river communications, the settlements and the prospects of Mashonaland, will be welcomed by those who take an interest not only in the past, but also in the present condition of this part of Africa. The volume has a large number of good illustrations, many of which are reproductions of a splendid set of photographs taken by Mrs. Bent.

ASCENT OF MOUNT DEMAVEND.

The following is an extract from a letter of Mr. Evelyn Grant Duff, Third Secretary at the British Legation in Teheran, describing his ascent of Mount Demavend in Persia (compare the account of Sven Heden's ascent, *Proceedings*, 1892, p. 565):—

"I started on August 12th, 1892, from the Minister's camp on

* Compare also Schlichter, 'Ptolemy's Topography of Eastern Equatorial Africa,' *Proceedings*, R.G.S., September, 1891.

the Lar river for the ascent of Demavend, accompanied by Lieutenant Rosen of the German Artillery, a servant, a groom, and a muleteer. We forded the river about two miles below the camp and proceeded in the direction of the village of Rehua, from which the ascent is usually made. The natives call the distance from the Camp to Rehua four farsakhs, but it is really nearer seven. After passing the night at Rehn we set out on mules with the guide and one servant about 6 A.M. in splendid weather, intending if possible to camp at the first snow. The road was very rough and we had to walk nearly all the 16 miles which lay before us. After a long climb we reached, at 3 P.M., the tent of M. de Speyer, the Russian chargé d'affaires, who was making the ascent on that day. It was pitched at about 12,500 feet, and in the distance we saw the party making their way slowly down the face of the mountain, and I walked on some way to meet them. On arriving at the tent we found they had made the ascent in eight hours, and had taken rather over two coming down; they had spent about one hour on the top. M. de Speyer was kind enough to give us many useful hints. He told us as we afterwards found, that the ascent was nowhere dangerous but, merely *très penible*, and only possible for people with perfectly sound lungs and heart. After we had had tea together M. de Speyer proceeded on foot to Rehua, leaving us two of his guides, and we made ourselves comfortable with rugs and went to sleep in the open, meaning to start in the middle of the night. The cold was not excessive, and we slept soundly. Shortly after midnight our servant woke us, and we started with three guides for the summit.

The difficulty of climbing Demavend is that everything breaks beneath your feet. The upper part of the mountain is composed of lava and small stones, and near the top of great masses of pure sulphur. The ascent is made along a crest of rock which runs from the foot to nearly the top of the mountain, with snow slopes on either side and a good deal of ice. About two hours after our start the moon rose lighting the country below, which looked very weird, grey, and dead. At about 16,000 feet my companion began to feel very sick, and we had to make constant halts. I was afraid at one time that he would not be able to go any further. However, he showed great pluck, and after another couple of hours began to feel a little better. Personally I did not feel sick, but my heart beat so violently that I had frequently to stop. Further up we both began to feel very sleepy in spite of the cold, which about sunrise was severe, and more than once as we halted I dropped off, and the guide woke me when we started again. The sunrise was very fine, making the icicles all round us look like flames; but the country is so brown and desert-looking that what should have been a magnificent view was like nothing but a physical geography map. We were then at about 17,000 feet as nearly as we could calculate. It was very slow work, as after every few yards

even the guides had to stop and pant for breath. They gave us garlic to eat which relieved our breathing, nauseous as it was. I noticed that one of the guides spat a great deal of blood, and all seemed to suffer. These men are not guides in the ordinary sense of the word, but merely collectors of sulphur who more or less know the way to the summit. In any emergency they would be utterly useless, and they give no assistance. When near the summit I began to feel much better, and Rosen was evidently less affected. The lava gave way to rocks of sulphur which looked very strange against the snow.

At length we reached the top of the crest of rock along which we had been crawling for so many hours, and the summit appeared quite close. The snow increased very much, but a foot under the sulphur it was so hot that it burnt one's hand, and fumes came out in some places almost violently. At the top of the crest of rock there is a kind of snow-plateau which slopes up to the summit. Here we stopped some time to examine the sulphur-rocks and to gather some fine specimens of sulphur crystals. We were now about 600 feet from the summit, which we reached at 11 A.M. after ten hours' climb. The great elevation spoils the view and dwarfs all the neighbouring mountains. The view on the Caspian side, though the day was, on the Rehua side, perfectly clear, was much obscured by thick banks of clouds over the sea. Once for a moment the clouds parted, and we could see what must have been water, but almost immediately the two great masses rolled together again, reminding one of Milton's famous simile in the second book of 'Paradise Lost.' The crater is much smaller than that of Etna, and is completely filled with snow. The whole summit seems to be one mass of pure sulphur, everything being primrose yellow where the rock showed above the snow. In the distance we could see the lake of Kum, the salt desert, and far away beyond Kasvin.

About noon, after a much needed lunch, we started for our camp. The descent of Demavend is extremely simple. You sit on the snow, preceded by a guide, and slide down on your back as far as the snow takes you. Of course one gets very wet, but the relief of doing in a few minutes a distance which has taken ten hours to ascend is immense. It was very enjoyable, and we agreed that it was worth the very unpleasant experiences of the morning. On one snow slope a herd of eight wild goats passed me quite close, and seemed indifferent to my presence. They are usually the shyest of all game. Lower down I saw several royal partridges (Kabk-i-darri) and the traces of many more. It is a magnificent bird, with a strange weird cry. I also saw many coveys of the ordinary French partridge. The last part of the descent after the snow ceases is very trying, the ground being covered with large rolling stones and there being quantities of a kind of thistle-like plant with thorns that go through everything. We reached our mules early in the afternoon and Rehua about dark. It was curious that neither of us felt

very tired though we had been so long on our legs. I put this partly down to the fact that we did not wear boots but Persian "givés," a kind of soft shoe, which for rock-work is preferable to any boot I have ever worn. We did not venture into another Rehua house, but slept on the grass, and next morning rode back to the Minister's camp in time for luncheon."

ANGLO-PORTUGUESE DELIMITATION COMMISSION.

Major Leverson and the other members of the Commission for the Delimitation of the Anglo-Portuguese Boundary in East Africa, reached England early in January, having had to suspend their labours in the middle of November owing to the commencement of the rainy season, which rendered further survey operations almost impossible.

The work executed during 1892 includes the determination of the latitude and longitude of Massi-Kessi, and the survey of a narrow strip of territory running south from about latitude 18° S., and longitude 33° E., to the north-eastern corner of the Transvaal (*i.e.*, the junction of the Limpopo, and Pafuri, or Unvubu Rivers). The longitude of Massi-Kessi was fixed by Captain S. C. N. Grant, R.E., by the method of moon-culminating stars in accordance with the recommendations of the Astronomer-Royal. The observations were taken with a portable transit instrument specially constructed for the purpose by Messrs. Troughton and Simms. It was impossible to make use of the telegraph, the nearest station being at Fort Salisbury, about 200 miles distant.

The results obtained were as follows:—Longitude of the observatory in the British camp near Massi-Kessi, 32° 51′ 24″ E. of Greenwich, and latitude 18° 53′ 33″ S. Between latitude 18° S. and the Sabi River a regular triangulation was carried out, 6-inch and 7-inch theodolites being used for the purpose. The detail was sketched in with plane-tables.

From the Sabi to the Limpopo, owing to the dense bush and total absence of conspicuous points, it was quite impossible to continue the triangulation, and the work done in the section between those rivers consists of route sketches, and the fixation of numerous points by observations for time and latitude. The junction of the Sabi and the Lundi was found to be situated a few miles west of longitude 32° 30′ E., and that of the Limpopo and Pafuri somewhat to the south, and far to the west of what it is shown to be on most maps.

The *personnel* employed on the survey work included Major J. J. Leverson, R.E., Captain S. C. N. Grant, R.E., Lieutenant C. S. Wilson, R.E., and five non-commissioned officers of Royal Engineers. Captain F. E. Lawrence, Rifle Brigade, and Dr. Rayner, Grenadier Guards, accompanied the Commission. Several Portuguese officers were also engaged

in map-making, but usually worked independently of the British party. An agreement was, however, always come to with reference to the fixation of the most important points.

The most northerly point reached by the Commission is in the valley of the Gaveresi, a little north of the main watershed separating the basins of the Zambesi and the Pungwé. The pass by which this watershed was crossed was about 4600 feet above the sea. Other high passes crossed by the Commission were the pass between the basins of the Sabi and the Pungwe near Umtasa's Kraal, 5400 feet, and the Chimanimani Pass, 5200 feet. The whole country as far south as the Umswilizi River is extremely mountainous, and is traversed by numerous streams. South of this it gradually sinks towards the Sabi River, and becomes less fertile and less well watered.

Between the Sabi and the Limpopo (locally called the Umiti) the country is almost a dead-level plateau raised a few hundred feet above the rivers. It is covered with thick bush, is very sparsely populated, and has a very poor soil. Water is scarce—all the rivers between the Lundi and the Limpopo being, at the time of the visit of the Commission (September), mere sand-beds with very occasional small pools of water.

The Umswilizi River, of which little appeared to be known beforehand, was explored from the point where it debouches into the plain, near Gungunyane's old kraal, almost to its source, and was found to run for nearly all its length through a beautiful gorge, and to consist of numerous long still reaches separated from each other by rapids.

Where crossed by the Commission the Sabi, the Lundi, and the Limpopo Rivers ran in sandy beds from a quarter of a mile to a mile broad, large portions of which were dry. At the fords the water was nowhere more than 2 feet deep.

About 5 miles above the junction of the Sabi and the Lundi an important series of cataracts and rapids, which it is believed are not marked on any map, were discovered on the former river. Their origin appears to be due to the intrusion of a broad dyke of porphyry through which the river has had to force a channel. The scenery in the neighbourhood of the cataracts is very grand and weird. The site is somewhat difficult of access, and the Commission had, unfortunately, not sufficient time to make a thorough exploration of them, nor to determine their total height or length.

THE WESTERN LOWLAND OF ECUADOR.*

By Dr. Th. WOLF, late Government Geologist to the Republic of Ecuador.

The Western Lowland of Ecuador forms, of course, the smallest part of the country; but it is the most beautiful district along the Pacific coast of South America, and the one on which nature has been most lavish. Its superficial area is about 28,950 square miles. As late as the end of the tertiary period the waves of the ocean washed the foot of the Western Cordillera of Ecuador; the only parts of the land which may have projected above the water in the form of islands being a narrow chalk ridge of hills, which runs from Guayaquil westwards to the sea, and then northwards through a portion of the province of Manabé, together with some isolated summits of greenstone. At the commencement of the quaternary period a part of the northern half of the lowland appeared above the ocean, while the southern half was covered over by an immense sandstone formation. The latter, containing every here and there the bones of mastodons and horses, was, at a very recent period, subjected to upheaval, which gave to the country very nearly its present configuration. The great low-lying plain east and west of the Gulf of Guayaquil, as well as smaller alluvial plains at the mouths of certain coast rivers lying only a few feet above the sea-level, are quite recent formations, produced by the gradual filling up of the gulf, which was formerly of much greater extent, with the shingle and mud brought down by the streams. It is a true delta formation, and the process is still going on. The highest points of the coast ridge attain an elevation of about 2300 feet in the chalk range between Guayaquil and the sea, and in the Cordillera of Chongon and Colonche. In the tertiary region there are summits of from 650 to 1000 feet. The quaternary marine strata forms a gently undulating country, rising from 65 to 260 feet above sea-level, while the extensive plain of alluvium is quite level. The rivers, which issue from the Western Cordillera, do not flow due west; but, in consequence of the chalk range which runs north and south, form two extensive river systems, the larger and more beautiful of the two—viz., that of the Rio Guayas, with its complicated network of canals, emptying itself into the Gulf of Guayaquil; the other system (northern), that of the Rio Esmeralda, pouring its waters direct, without any delta, into the sea exactly at 1° N. lat. The two systems are divided by some gently-rising ground, where the headwaters of both sides are so interlaced that a small canoe could easily make the passage from one river system to the other. Although the northern and southern halves of the lowland present many points of agreement with each other as regards their hydrographical and orographical features, they are very distinct as regards their climates and in other respects. The northern is virgin country, covered with humid forests, and almost uninhabited, whereas the southern is a cultivated region, very diversified, and well populated. The boundary between the two lies roughly along a line drawn from Cabo Pasado in a south-easterly direction towards Chimborazo.

The ocean north of Cabo Pasado has a mean temperature of 82° (Fahr.), south of the same point, of only 73°. This circumstance exercises an important influence upon the climatic conditions of the Ecuadorian lowland. In the north a hot and fairly moist climate prevails, in which the dry and wet seasons of the year are not sharply defined, and in consequence of which the country is clothed

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* Abstract of Paper read at the Berlin Geographical Society, December 3rd, 1892, in continuation of a previous Paper on the High Andes of Ecuador (*Proceedings*, R.G.S., 1892, p. 126.) Specially reported for the *Geographical Journal*.

with a luxuriant and evergreen vegetation. The highest temperature, viz., 28° (Fahr.), prevails there on the coast, and falls in the shady forests to from 77° to 79°. The wealth of water is enormous; but the water is nowhere stagnant. On the contrary, it is quickly-flowing, and, consequently, the climate is not unhealthy. Very few mosquitoes or other pests are met with. The magnificent primeval forests are rich in palms, excellent timber, coco-nut trees, caoutchouc, and vanilla plants.

In spite of the rich humus, the country is for the most part uninhabited, and the population, which numbers only about fifteen thousand souls, is settled almost exclusively along the sea coast. Very little attention is paid to the cultivation of the soil. The chief town, Esmeralda, consists of a collection of thatched houses, with about 600 inhabitants. There is not a single bridle path in the country, with the exception of the natural path which the sea-shore affords at low tide. Trade along the coast and with the interior is, therefore, carried on only by means of boats and canoes. The reason why this region is so sparsely populated is that the number of immigrants coming into Ecuador is too small. About fifty years after the conquest, the settlement of Ecuador by the Spaniards was finished. After this scarcely one important place was founded. It does not now occur to any of the poor highland people to migrate from their barren homes down into the rich forests of Esmeralda, and become prosperous by the cultivation of cocoa and coffee. A further reason is to be found in the absurd but absolute prohibition of the Spanish Government, repealed again and again during the last two centuries, against forming a harbour north of Guayaquil, or opening up a route from the coast to the Highlands. From the time of the conquest numerous Indian tribes have inhabited these coasts; but now they have practically disappeared, and their scattered remnants have become so mixed with the white and black population as to become unrecognisable.

Only one race has kept itself pure—viz., the Kayapas, of the valley of the Rio Santiago, who, shut off from the rest of the world, lead a lazy life in their beautiful palm forests. Their language distinguishes them from all the other races of South America at present known. The tribe numbers now about two thousand five hundred. A curious phenomenon in the forest region of the Esmeralda is presented by a couple of pure negro villages on the River Santiago—viz., Uimbi and Kachabi, which date from the time of the emancipation of the slaves (1854). These former negro slaves have associated themselves together in the forest solitude, with the object of leading a purely African life, free from disturbance, according to their own liking, and of indulging in the "dolce far niente," surrounded as they are with an abundance of bananas and other easily obtainable food. They go about almost naked, and have become regular but harmless savages again. When the negroes want money, say for brandy, they wash gold, for the whole basin of the Rio Santiago is very rich in gold and platinum.

The southern half of the Ecuadorian lowland presents quite another picture. In the first place the climatic conditions are different. On the sea-coast it is fresh and pleasant, but the further east one goes the hotter it becomes. In the coast regions, on the Island of Puná and the Great Peninsula of Morro, along the coast from Manta to Bahia de Caráques, a mean temperature of from 73° to 77° (Fahr.) prevails; it rains very little here, the short rainy season often lasting only two months (February and March). In the low and hilly stretches of country, the so-called cactus and mimosa vegetation prevails. A sparse and ephemeral grass crop covers the ground from February to April, but for the rest of the year everything is scorched up, and of a brownish grey colour. Where no artificial irrigation is possible it is out of the question to expect extensive cultivation. The

forests which clothe the mountains lose their leaves in the dry season; they are rich in the hardest timber and in certain resins and balsams. The climate is wonderfully healthy and pleasant, like that of the coast of Peru. It is the only part of Ecuador where there is a lack of fresh water. On the Island of Puná and the Peninsula of Morro there is not a single stream. Only where the higher mountains approach quite close to the coast, as for example, north of Santa Ebena at Manglar Alto or south of Guayaquil, between Naranjal and Machala, the character of the country changes, and there is an abundance of streams and evergreen woods; but elsewhere brackish cistern-water is the only water available. When we advance a few miles from the coast into the interior the climate changes; the temperature and humidity increase, and the vegetation consequently alters in character. Guayaquil possesses a mean temperature of from 79° to 81°, with regular wet and dry seasons, the former lasting five and the latter seven months. The nearer we approach the foot of the Cordillera the shorter the summer or dry season becomes, and the longer the winter or rainy season, until we arrive at the lowest slope of the mountains, that muggy, ever-moist region of primeval forest where it rains almost throughout the whole year, at least every night, and where a mean temperature of 82° prevails. This region is badly situated for health. But otherwise it may be said that all the rest of the lowland has, for the tropics, a good and healthy climate, and that the climate has unjustly been very much decried by superficial travellers, because yellow fever appears here and there. Yellow fever is not endemic in any part of Ecuador, but is always imported, particularly from Panama, through insufficient quarantine measures. The dry season comes to an end in December.

After the first refreshing rains the aspect of the country changes as if by magic; the savannahs are covered with an emerald-green carpet of grass and plants, the bushes and trees assume the richest covering of leaves and flowers, animal life wakes up, and it is astonishing what vegetation produces under the influence of warmth and moisture; by July most plants have cast off their leaves again. The enormous wealth of water in the many large rivers makes up for the absence of rain in the summer months in the plains bordering them. The zone of evergreen trees, which is identical with that of the cacao, commences in the river system of the Guayas on the Rio Daule, on the main stream (the Rio de Babahoyo) somewhat above Zamborondon, on the Rio Chimbo above Yaguachi. The whole river system of the Rio Guayas may be described as one great paradise. Plantation after plantation, hacienda after hacienda, extend along the main stream; every house is surrounded by magnificent fruit-trees, bananas and palms. Now we wander for hours through the dark green cacao forests, now through low coffee bushes, again over bright green fields of rice and sugar-cane, or along the steep slopes of darker tobacco fields; suddenly we find ourselves for a short stretch in dense forest, where the monkeys are chattering; then we come upon thousands of cattle and horses pasturing on the open savannahs. These savannahs, with their great isolated trees or clumps of bamboo grasses, 20 feet high, present a wonderful sight. The cacao forms the chief wealth of the country. In spite of an extremely primitive system of cultivation, Guayaquil exports on an average 10,000 tons a year. An almost incredible quantity of tropical fruits is shipped weekly on the great Pacific steamers and sailing vessels for the Peruvian and Chilian coasts, which are also supplied with timber and with the famous bamboo cane (Caña de Guayaquil) of Ecuador.

The population of the region dealt with may be estimated at about two hundred and ten thousand, of which about twenty thousand may be regarded as belonging to the white races; the remainder consists of negroes, Indians, and hybrids. The so-called Panama hats form the chief industrial product. These hats are

made from the fibre of the "toquilla" or hat-palm (*Carludovica palmata*) by the Indians of the dry coast regions, and the price of them is from half a dollar upwards; for a hat of the finest description, on which an Indian works for five months, as much as from 100 to 150 dollars is paid in the Antilles. Guayaquil with its forty-five thousand inhabitants is a rapidly progressing and flourishing town, which in the course of the last fifteen years has doubled its population. While the people of the highlands are as a rule reserved, fanatical, close-fisted, and conservative, the inhabitants of the depression are full of life, open, lavish, tolerant, and liberal-minded in every respect. There is a great contrast between life in the sad, melancholy high valleys and the stirring activities of the rivers, on which often from fifteen to twenty steamers and hundreds of other craft carry on trade.

THE MONTHLY RECORD.

THE SOCIETY.

Educational Lectures.—The first of the series of ten Educational Lectures, by Mr. H. J. Mackinder, was given in the Hall of the University of London, Burlington Gardens, by the kind permission of the Senate, on Friday, January 20th. There was a very large audience, many of whom were teachers. The subject of the series is "The Relations of Geography to History in Europe and Asia." The first lecture dealt with "The Theatre of History," and was richly illustrated with special maps and diagrams, shown on the screen by means of the lantern.

Mr. Mackinder said that in considering the influence of geographical environment on human history, it is essential, as in all departments of historical inquiry, that we should bear in mind not merely facts as we now know them, but also men's former beliefs concerning them. Therefore he commenced this course of lectures on "The Theatre of History" with a brief survey of certain aspects of the history of geography. In one point especially the present differs from the past. All the earlier ages had an outer and an inner geography. Before Columbus and Da Gama the theatre of history was girt by the unknown; now the unknown is besieged in its last retreats by the known. Men's minds have a new definite environment in the place of limitless possibilities. The imagination of Homer fed on the suggestions of the half-known, and played freely in the *outer geography*. With the theory of the sphericity of the Earth came the necessary consequence of a limit to the discoverable. The contrast between the discovered "œcumene" and the remainder of the globe's surface is in the background of all Greek geography. Was the œcumene an island encircled by ocean, or did one continuous continent isolate the ocean-lakes? Was there a second, an Antipodean œcumene, inhabited yet inaccessible? These were questions which fascinated the pagan philosophers. Early Christendom all but suppressed the theory of the sphere, but the idea of the œcumene lived on in men's minds, though deprived of its supporting globe. It reverted indeed to its primitive circular outline. At the geographical *renaissance* globe and œcumene were rejoined, the latter exaggerated in length, the joint work of Ptolemy and Marco Polo. The result of the error was that Columbus discovered a new "world" (œcumene). The theory of a third—the Antipodean œcumene—was exploded only by James Cook. As a result *of this history* the world is to-day full of misnomers, registers of half-knowledge.

These in turn tend to mask facts. In the next lecture it will be seen whether the masks cannot be torn off and the facts left patent.

The second lecture was given on the 27th, the subject being, "The Roads to the Indies."

The succeeding lectures will be on the following subjects:—

"The Belt of Desert and Steppe."
"The Gates of India and China."
"The Approaches to Europe."
"The History of Russia as a Commentary on its Geography."
"The Alps as a Factor in European History."
"The Approaches to Italy."
"The Divisions of Gaul."
"Some Geographical Analyses of British History."

Lectures to Young People.—The two lectures to young people given by Mr. John Coles, the Society's Map Curator, on December 30th and January 6th were attended by large audiences both of young and old, the former, of course, predominating. The numerous pictures shown on the screen were themselves full of geographical information, and these Mr. Coles supplemented with facts and anecdotes of personal adventure in such a way as to maintain the interest of the audience throughout. That the lectures may be regarded as decidedly successful seems evident from the fact that the attendance at the second was even better than that at the first.

EUROPE.

The Marshes of West Russia.—It is stated, in an official report, that out of the 16,000,000 acres of swamps which cover West Russia, nearly 6,750,000 acres have already been covered with canals during the last fifteen years. The aggregate length of these canals attains 2196 miles. Many interesting facts have been brought to light during these works. It appeared that whole rivers and small streams, which previously existed, had been silted up with mud and sand. In one river which had been formerly barred for building a water-mill, the wheel of the mill was found under 3 feet of mud, which shows the rapidity of the accumulation of silt. The bottom of Lake Jid or Knyazozero, which was supposed to be unfathomable, proved to be 56 feet higher than the level of the Pripet river, and the lake could thus be partially emptied. The net result is that more than 800,000 acres have been transformed into meadow land; nearly 1,200,000 acres of forest land, which were formerly impracticable marshes, have been dried, and nearly 1,250,000 acres of good forests have been brought within distances of less than 5 miles from some one of the canals, so that timber can easily be exported. The fevers which were endemic in the marshy regions are undoubtedly reduced, and the terrible disease of the hair, the

plica polonica, is said to have entirely disappeared. The Pinsk marshes have, however, rooted themselves so firmly on the map of Russia that they are still represented in the best non-Russian atlases as covering an enormous area on both banks of the Pripet, although they are now practically obliterated from the land itself, and their site is covered with prosperous farms. M. Venukoff submitted a note to a recent meeting of the Paris Academy of Sciences, pointing out this common cartographical blunder, and correcting it. He states that since the great reclamations the peasants of the district have been enriched by the increased value of the land, and that it is proposed to bring immigrants from Great Russia, where the population is excessive, to occupy the new lands.

ASIA.

The Pamirs.—M. Ximénès, of the Paris Geographical Society, gave a lecture at Moscow, in the early part of January, on his recent travels in the Pamirs. In the course of his remarks, he is reported to have said, "This country is by no means so wild and miserable as has been asserted. . . . Its magnificent pasture lands afford nourishment to herds of superb cattle and excellent mountain horses; and nature here offers many charming aspects, with its clear sky, majestic mountains, mighty glaciers, rapid torrents, azure lakes, and green plains. Moreover, minerals are to be found in abundance, including rubies of great value." The reference to pasture seems to require some qualification. Captain Younghusband (*Proceedings*, 1892, p. 225) states that on the Pamirs, although grass is plentiful in certain localities, it covers only a small proportion of the valleys; while Mr. Littledale (*ib.* p. 15), who was told by a Kirghiz that grass grew luxuriantly on the Great Pamir, found nothing but utter barrenness. M. Ximénès, according to the summary of his lecture, which has reached England, states that the Alai Valley is occupied by three Kirghiz tribes, numbering more than 17,000 *kibitkas*. Reckoning that each *kibitka* contains five persons, this would give a total population of 68,000, which is within 1150 of the estimate made by Colonel Kostenko in his gazetteer ('The Turkestan Region,' 1880). M. Ximénès enters at length into the political questions connected with the Pamirs. Here it is enough to say, that in his opinion, the whole of Afghan Turkestan, together with the States on the Upper Oxus, "naturally forms part of Russia's possessions, notwithstanding international agreements and conventions to the contrary."

The Transcaspian Territory.—The Russian *Official Messenger* summarises the results of the ten years' Russian occupation of the Transcaspian territory as follows:—The territory covers 220,450 square miles, and is divided into five districts—Manghishlak, Krasnovodsk (which includes the Chikishlar and Karakalinsk cantons), Askabad (Durun and Atek cantons), Tejen, and Merv (Seraks, Penj, and Elotan

cantons). Its population numbers 280,443 natives and 16,351 immigrants. The former are chiefly Turkomans (chief stem, Teke), and a few Kirghizes in the Krasnovodsk and Manghishlak districts. The Turkomans are neither entirely settled nor entirely nomadic; but their *auls* (villages) have each their distinct water, gardens and fields. However, only part of the inhabitants have permanent dwellings, the remainder camping with their herds. They are divided into two groups—the *charvà* and the *chomurs*. The former are the richer class, and depend chiefly upon their live-stock, following their sheep and camels over the steppe. The *chomurs* are the poorer class. They have no herds, and stay in the villages. The Turkomans are not very industrious, and the forts and canals of their villages have chiefly been built by their Persian slaves. All housework is done by women. They are not very religious, and have but few mollahs. They follow the customary *lex talionis* with tribal responsibility for some crimes. The penalties of capital punishment, or cutting off a hand for stealing, and the like, have been abolished since the establishment in the territory of Russian judges, who, nevertheless, pronounce their sentences as far as possible in accordance with the customary law. Raids upon the neighbours are dying out, and efforts are being made to encourage agriculture, and especially irrigation. Some waterworks are carried out by the Government, but the system is chiefly to encourage the *auls* (communities) themselves to repair the old wells and canals, and to dig new ones. Loans without interest are made for that purpose to the *auls* from a special irrigation fund. The management of all matters connected with the distribution of water is left in the hands of the *auls* and their elected *mirabs*. The usual crops of wheat and barley are from 12 to 20 bushels for each bushel sown. Lucerne, rice, millet, and cotton also give good crops. The melon-orchards are in a satisfactory state. On January 1st, 1890, it was reckoned that there were on the territory 1,818,615 sheep (34 per family), 115,320 camels, 59,255 horned cattle, 83,890 horses, and 35,570 donkeys. Various domestic trades in leather, silver, arms, and so on, are carried on by the Turkomans. Salt is now extracted to a considerable amount, and in 1889 about 10,000 tons were exported to Persia. Naphtha is found in profusion on the Cheleken Peninsula; asphalt and ozokerit have been discovered in the Balkan Mountains. Sulphur is obtained in the Askabad and Krasnovodsk districts; lignite and coal are found in the Manghishlak Peninsula. The yearly returns of trade (import and export) amount to £950,000. As to the Transcaspian Railway, it appears that in 1891 no less than 72,683 tons of goods were imported into Russia from Central Asia by this railway, out of which 42,336 tons were raw cotton (as against 18,814 tons in 1888). The exports from Russia on this line were chiefly sugar, £750,000 (owing to the bonus offered by the Government), manufactured goods (203,000 cwt.), kerosene oil (29,890 cwt.), and timber.

Forests in Russian Turkestan.—Russian Turkestan is so poor in forests, and the existing woodlands have suffered so much of late from reckless cutting, that attempts are now being made to replant, partly in the mountains, and partly in the Steppes. It is estimated that of the total area of Turkestan (162,000,000 acres), the territory has but 945,000 acres of forest land in the mountains, and nearly 16,000,000 acres of bushland in the Steppes. As to the plantations of trees which are met with in all native towns and villages, they cannot even satisfy the wants of the steadily increasing population for building purposes. The saxaul tree has been pitilessly exterminated all along the banks of the Syr-daria, and for a great distance around the centres of population, and, as natives say, "the saxaul has fled into the depth of the Steppes." The forests in the mountains were also recklessly cut down till the year 1879. At the same time, the whole of the region is, from some physical change, generally undergoing desiccation. Both glaciers and rivers are decreasing; the lakes dry up; the extremes of temperature become more marked; and the moving sands are increasing in areas. The recent attempts at planting forest trees, without irrigation, which were made in the province of Samarkand in 1880, have proved quite successful; so also the attempts made in the dry Steppe in the south of Samarkand, between the Shaar-sabiz Mountains and the Dargh Canal, where nearly 400 acres were planted. Since 1880 the system has been improved, the young trees being now planted on the slopes of the hills in terraces, which follow the contour lines.

Exploration in Eastern Siberia.—The important expedition despatched in July, 1891, to explore the valleys of the Kolyma, Indigirka, and Yana, under the leadership of the late M. Cherski, is not to be abandoned, although its leader has died, the Academy of Sciences of St. Petersburg having entrusted the leadership to Baron E. Toll, well-known for his exploration of the New Siberian Islands. Recent news as to the discovery of mammoth remains at Sachaurach, not far from Kasachje, has given a new turn to the expedition, which will proceed next spring to that place. Baron Toll intends to follow this stream both upwards and downwards to the Arctic Sea, and if possible to make an excursion westwards.

Seismological Work in Japan.—Professor Milne, F.R.S., sends a recent issue of *The Japan Herald*, in which he summarises the seismological work done in Japan up to the present time, most of which has been accomplished by members of the Seismological Society, established in that country in 1880. The first great problem was naturally that of devising an instrument which should afford accurate quantitative measurements of the vertical and horizontal components of earthquake motion; and so fully has it been solved that it is now possible not only to determine the period and amplitude of shocks of earthquake,

but to recognise tremors due to strong high-level winds blowing against a range of mountains even at distances of 200 miles. A very extensive field of inquiry has thus been opened up, and although considerable time must elapse before seismologists are in possession of sufficient data to settle some of the larger questions raised, the discussion of records already obtained has yielded results of great interest. It appears that an earthquake in which the amplitude of motion amounts to $\frac{1}{25}$ inch, is quite perceptible, and sometimes even alarming in its results, while an amplitude of 2 inches, with a short period, would probably cause widespread destruction. The back and forth movements constituting the *shock* usually have a period of one or two seconds, while the ordinary shaking motion has in most cases a period of one-third to one-fifth of a second, increasing considerably towards the end of the disturbance. In severe earthquakes the amount of motion decreases rapidly below the surface; hence houses with a sunk flat and free area are found to escape in a remarkable manner. Besides appointing a committee to deal with such practical questions as the protection of buildings, the Japanese Government has established an Earthquake Bureau under the Meteorological Department. Seismographs have been erected in several districts, and over seven hundred stations record "eye-observations" of earthquakes. From the data obtained in this manner it has been ascertained that the greater number of shocks occurring in Japan originate near the eastern coast, that there are numerous definite centres of energy of greater or less intensity, and that on an average at least two shocks are felt daily. The extent of land area shaken varies in a striking manner from year to year, but it has not yet been possible to connect its variations with those of any meteorological or other element. Professor Milne concludes his paper by sketching the programme of the Seismological Society for the immediate future, which includes no less than eight separate investigations: velocity of earthquake propagation, involving questions of the earth's rigidity; variations in the value of g; submarine observations; magnetic observations; bending of the Earth's crust; tremometric observations; earth-currents; and earth-oscillations. Other investigations of scarcely less interest and importance have become possible with the improvement of seismographs, or have been suggested in the course of the work on earthquakes. Amongst these may be mentioned the calculation of ocean depths from the rate at which waves are propagated along the surface, the automatic recording of the velocity of a railway train, the detection of irregularities in the line due to want of ballast, imperfections in bridges, etc., and the effect of artificial earthquakes caused by explosions or the falling of heavy weights.

Major Raverty's Work on Afghanistan.—The India Office has at length issued the fifth section of Major H. G. Raverty's 'Notes on

Afghanistan, and part of Baluchistan, geographical, ethnographical, and historical, extracted from the writings of little-known Afghan and Tájzik historians, geographers, and genealogists, the histories of the Ghúris, the Turk sovereigns of the Dihli kingdom, the Mughal sovereigns of the house of Timúr, and other Muhammadan chronicles, and from personal observations.' The previous sections of this important work have been noticed in the *Proceedings*, viz., in Vols. II., 708, III. 692, and VI. 354. The fifth section appears to be the concluding one, and it would have been larger than all the other sections put together, but we learn from an official note that the work has been brought by the India Office to a "premature end," for reasons which, however, do not transpire. This is regrettable, for the amount of information, research, and learning contained in the three hundred and odd folio pages now issued, and, indeed, throughout the entire work, is really astonishing. To give a detailed account of the contents of the present section is difficult within the limits of a short note; but we may mention that it includes a complete list of the passes across the Sulimani Mountains, debouching into the Bannu and Dehra Ismail Khan districts. These passes, alone, amount to no less than ninety-four in number, a fact which will astonish those strategists who talk about the facility of blocking or guarding the north-western passes in the event of an invasion of India. Other information in the same section relates to the various routes and to the tribes scattered about the region adjoining the British boundary from the Hindu Kush to Sind. For instance, a full account is given of the Powandas, or Povindas, the well-known nomads who follow mercantile pursuits, and travel backwards and forwards between the Afghan highlands and the plains of India. The author also treats of the Waziris, Sheranis, and other large tribes, as well as of the district of Sibi, to which about 70 pages is devoted. The scholarly accuracy of Major Raverty, whose knowledge of Pushtu, Persian and other Oriental tongues enables him to derive his information from original sources, is patent throughout the work. We trust that the author will be enabled to complete the work on the lines originally laid down, and in that case he will doubtless take steps to have a proper index prepared under his own supervision, that attached to the present volume being, we regret to say, very inadequate. It would also conduce largely to the usefulness of the work to have an analytical table of contents and a good map.

AFRICA.

Captain Binger's Expedition from the Ivory Coast to the Southern Sudan.—At the meeting of the Geographical Society of Paris on December 16th, M. Marcel Monnier, who was a member of Captain Binger's last expedition to the heart of the Sudan, gave a full account of

his journey and of the work accomplished by the mission. The object of the expedition was two-fold—first, to act in conjunction with the delegates of the British Government in determining the boundary line between the French territories on the Ivory Coast and the British possessions on the Gold Coast, according to the protocol of June, 1891; and secondly, to explore the Southern Sudan from Bonduku to Kong, and to consolidate French influence in the regions visited by Captain Binger three years before. The expedition landed at Assinie on January 11th, 1892, and separated into two sections after leaving Nugua, one under Lieut. Braulot and Dr. Crozat proceeding straight to Dibi; the other, under Captain Binger, making a *détour* by way of Alankabo and N'Gakin. The journey through the dense forest belt, which extends from the coast almost up to Bonduku, was most toilsome. It occupied no less than eighty-four days, and M. Monnier gives a vivid description of his experiences. He states that even in the Cordillera and in the forests of Java, he did not meet such difficulties. In the course of two days' march, soon after leaving Nugua, fifty-seven watercourses were forded. The supply of provisions was precarious, and the delays at the villages in the clearings were most wearisome. Great was the joy of the whole party on reaching Sapia, on the verge of the forest, and only five hours' march from Bonduku. Just before entering the latter town, the chain of hills, which forms the watershed between the basins of the Comoe and Volta, is crossed. On April 29th the expedition entered Bonduku. The greatest drawback to this place is the want of water. The person who exercises most influence there is the Almamy, or religious chief, whose decisions have the force of law. Ibrahima Kitate, the Almamy of Bonduku, showed himself most friendly to the travellers. The population may be estimated at from seven thousand to eight thousand souls. The town is well situated commercially, commanding, as it does, the whole of the trade of that part of the great bend of the Niger. The journey from Bonduku to Kong, a distance of 190 miles, occupied seventeen days. There is a path, practicable for beasts of burden; the country is very monotonous, consisting of a succession of slightly undulating plateaux and a desert, covered with tall grasses with a few clumps of trees. The expedition arrived at Kong on May 27th. Kong is more healthily situated than Bonduku; it stands on a table-land at an altitude of 2300 feet. The population is two or three times greater than that of Bonduku. The old king of Kong, Karamoko Uli, had not forgotten the treaty made by him with Captain Binger three years before, and he gave the expedition a cordial welcome. At Kong news arrived of the massacre of Captain Ménard on the frontier of the States of Samory. About the middle of June the expedition separated, Dr. Crozat, the news of whose untimely death from fever arrived in Europe quite recently, proceeding northwards to the country of Tieba, Lieutenant

Braulot eastwards to the district of Buna, and M. Monnier, with Captain Binger, returning to the coast through Jimini and Diammala. From Kong to Dakhara, the capital of Jimini, Captain Binger followed his old route, but afterwards diverged to the south-west in order to traverse Diammala, a country hitherto unknown. After three days' marching from Jimini the traveller passed from the basin of the Comoe into that of the Isi and crossed the Be, one of its principal affluents. One day more brought him to Satama, the capital. The country is well wooded and rich. Maize and other products are cultivated generally. The people, who had never seen a white man, received Captain Binger well, and a treaty was soon concluded with the king. Through Diammala lies the most direct route to the coast; it is the key of Bawle, and, further, comprises in its dependencies the country of the Gaunes, one of the principal centres for the production of the "kola," so much sought after by the natives of the coast. On continuing their journey further into Bawle, the travellers were unexpectedly brought to a standstill at the village of Siradine-Tombo by the hostile attitude of the natives. They were then only a few miles from Wassaraduga, on the River Isi, down which they had intended to proceed to the coast. However, a retreat had to be made to Satawa, and then striking off to the south-west, they made their way to the Comoe, and fifteen days later reached the coast, after an absence of six months. The expedition altogether covered about 1245 miles of country, of which about 350 were over quite new ground.

From the Mobangi to the Shari.—Early in the year 1891 the French Government determined to despatch an expedition into the interior of Central Africa in support of the great expedition, then being conducted by the unfortunate M. Crampel to Lake Chad. The mission was entrusted to M. J. Dybowski, and his instructions were to penetrate from the Mobangi as far as possible into the interior of the central plateau, and to establish a series of posts with the view of consolidating and extending French influence in that region, and finally to effect a junction with the Crampel, mission. At the meeting of the Geographical Society of Paris on the 18th November last, M. Dybowski gave an interesting account of his travels. At Brazzaville, in the middle of July, the news arrived of the massacre of Crampel, but M. Dybowski determined to proceed northwards on his mission. He was accompanied by five Frenchmen and about forty-two armed natives, besides porters. The party left the Mobangi at Bembe, the point from which the Crampel expedition had a year before started, and struck due north through the forest. It was not long before an encampment of Musulmans was encountered, and M. Dybowski was assured by one of Crampel's sharp-shooters, who had made his escape from them, that they were the same party which had massacred the Crampel expedition. The Musul-

man camp was attacked and captured; the resistance was not great, but a number of the enemy were killed. Advancing further into the interior, the traveller arrived after ten days' marching at the point where the unfortunate Lauzière and Biscarat, of the Crampel mission, fell. The remains of the former were exhumed and brought back. The furthest point reached was just north of the River Shari (7° 26′ 30″ N. lat., and 17° 54′ 30″ long. E.), where it was found necessary to turn back, as provisions were failing, and the country ahead had been laid waste by robber bands of Musulmans. The country between the Mobangi and the Shari is one of the most prosperous and richest in Africa, and possesses an industrious population. Its prosperity would be greater were it not for the depredations of the hordes of Musulmans from the north. In the countries of Langwassi, Dakona, and N'gapu, the cultivation of maize, sorghum, &c., is general. The watershed between the basins of the Mobangi and the Shari lies a little to the north of the sixth parallel. The chain of hills forming it is composed of ferruginous rocks. Iron smelting is the most important industry in this district. Cotton and tobacco are grown extensively. In all the forests there is an abundance of creepers (*Landolphia*) yielding a caoutchouc of excellent quality. On the banks of the Shari the traveller came across a forest of bamboos measuring not less than from 50 to 60 feet in height. In the same region, along the small streams and in the swamps, he found numerous specimens of the wild date-palm. The Shari, at the point where the party crossed it, was about 65 yards broad; but it was evident that during the rainy season it is three or four times as broad. Its depth was from 13 to 16 feet. After returning to the Mobangi, M. Dybowski explored for a short distance the Ombella, and for a further distance the Kemo, another tributary of the Mobangi. A station was established at the junction of the two rivers, and another post on the Kemo in lat. 6° 17′, which was the extreme point reached on that river. Through all this region the traveller searched in vain for the so-called Lake Liba. He supposes that one of the numerous inundations, so common in that district, must have given rise to the reported existence of such a lake. M. Maistre, who is in command of another expedition, sent out to support that of M. Dybowski, writing from the station of Kemo, on the River Kemo, June 25th last, announced his intended departure for the north, across the country of the Togbos and N'gapus. He will then turn obliquely to the north-west and endeavour to reach the country of the Sara and the southern frontier of Bagirmi, thus connecting his itinerary with that of Nachtigal in the direction of Gundi. His expedition is composed of five Europeans (two of whom, MM. Briquez and Brunache, were members of M. Dybowski's mission), sixty-four Senegalese as an escort, and a hundred porters.

Lieutenant C. H. Villiers' Expedition in North-East Africa.—In a letter dated Lamu, December 1st, 1892, Mr. J. W. Gregory gives further information with regard to the movements of the exploring party under the command of Lieutenant Villiers. In consequence of the reported hostility of the natives in the neighbourhood of the Jub, it was deemed expedient to give up the original intention of proceeding to the interior by way of that river, and the party proceeded to Lamu, where all the men and stores were landed, these latter having been much damaged, while on board the steamer, during a heavy gale. The route it is now proposed to follow is up the Tana River, thence by Mount Kenia to Lake Rudolf, and after exploring the surrounding country, to proceed west to Bardera on the Jub River. From this place the party will turn northward and endeavour to cross Somaliland to Berbera. At the time of writing the party was much divided, Dr. Mackenan, with a party of seventy Abyssinians and a like number of Swahili porters, was marching to Ngoa, on the Tana, to form a camp. Sir H. Tichborne, Lieutenant Stanford, and Count Lovatelli, an Italian who had joined the expedition, had left with two companies of Somalis *en route* for Ngoa; Lieutenant Villiers was at Lamu, and Mr. Gregory was in camp near that town in charge of a rear-guard of eighty Somalis. Provisions of all kinds were extremely scarce in the country, so much so, that thirty tins of rice and dates which were brought from England sold at a high price, notwithstanding that they were saturated with salt water, and in a rotten condition. When all the party has assembled at Ngoa ready for a start into the interior, it will consist of more than three hundred men. News of a later date than the above has been received by telegram from Mombasa, in which it is stated that Lieutenant Villiers has joined Sir Gerald Portal's staff, and is now on his way to Uganda.

CENTRAL AND SOUTH AMERICA.

Sir Walter Ralegh's Map of Guiana.*—This map is a facsimile of a manuscript in the British Museum, which has now been published for the first time, the parts blotted or faded having been restored with the aid of Kohl's manuscript copy of the original of Schomburgk's publications of Ralegh's voyage. The map shows the course of the Orinoco and Amazons Rivers, and extends from their mouths to the Pacific coast. The greater part of the north and east coasts is supposed to be from Ralegh's own survey, especially in the neighbourhood of Trinidad; the western portions have probably been taken from Spanish reports. The fictitious Lake Manoa is represented as being about 200 miles in length, with a city at its eastern extremity which

* Sir Walter Ralegh's Karte von Guyana um 1595, von L. Friederichsen. Separatabdruck aus "Festschrift der Hamburgischen Amerika-Feier 1892."

was reported to be the largest in the world. The construction of the map is the same as that commonly in use during the sixteenth century, and shows rhumb lines, which, in order that they may be more easily distinguished, are coloured black, red and green. In the Hakluyt Society's Publications, 1848, there is the copy of a letter written by Ralegh in the autumn of 1595, which would seem to indicate that he at that time intended to present his map to the Government. In writing to Lord Charles Howard with regard to "The discovery of the large, rich, and beautiful empire of Guaya, &c.," he says:—"How these rivers crosse and encounter, how the countrie lieth, and is bordered, the passage of Cemenes, and of Berreo, mine own discoverie, and the way that I entred, with all the rest of the nations and rivers, your Lordship shall receive in a large chart or map, which I have not yet finished, and which I shall most humbly pray your Lordship to secret, and not to suffer it to passe your own hands; for by a draught thereof all may bee prevented by other nations. For I know it this very yeere sought by the French, although by the way they now take, I fear it not much." It is supposed that Ralegh did not carry out his intention of sending in his map, and that it was discovered among his papers, when he was arrested a second time, in 1618. The accompanying letterpress contains much interesting matter in connection with the map.

Los Penitentes.—This ("The Penitents") is the name of a picturesque and fantastic group of ice and snow, which forms one of the most remarkable features of the Argentine Cordilleras. It was described by Darwin in 'The Voyage of the *Beagle*,' and he supposed the formation to be due to the manner in which a great mass of snow had partially thawed. Dr. Brakebusch has lately given in *Globus* a new description and an explanation of the origin and formation of the remarkable pillars. In altitudes about 12,000 feet above sea-level extensive icefields are met with of a most peculiar appearance. Out of the dark volcanic ground rise gigantic columns and figures of dazzling white ice and snow, arranged in long parallel lines, and forming thousands of groups which from a distance have a strange similarity to thousands of human beings, standing motionless in the high and lonely valleys of the Cordilleras. When the pale light of the moon shines on the landscape the appearance of these "penitents"—as they are not inappropriately called by the inhabitants of the country—has something of a ghostlike and supernatural grandeur and beauty. Dr. Brakebusch believes that the penitents are the last remnants of glaciers which have been broken up into parallel portions in consequence of internal tension and under the influence of wind and water. These portions having separated into blocks and columns, the wind and sun further contributed to change their appearance and produce the striking forms now found.

The Volcanic Region of Chillan.—Señor Nogués presented to the Société Scientifique du Chili (March 21, 1892) the results of his travels and observations on the physical features of the Andesian volcanoes of Chillan (*Volcan Nevado*, 9526 feet) and surrounding glaciers, confirming the supposition of Pissis (*Geografia fisica de la Republica de Chili*, 1875, Paris) concerning the existence of moraines of two distinct epochs, and therefore of glacial periods, one of them being anterior to the present volcanoes. This accounts for the orography of the region.

Present Commercial Condition of Guatemala.—In a recent Consular report, Mr. Gosling supplies some notes on the present commercial condition of Guatemala. A marked revival has taken place in the trade of the Republic, and during the past five years the imports have been steadily improving. It is estimated that during the year 1891 no less than 52,449,500 lbs. of coffee were exported, roughly valued at £2,477,063. We also learn that the following lines of railroad have been approved of:—A line from the port of Ocos (Pacific) to the village of Santa Catalina, in the department of San Marcos; a line from a station on the Central Railway of Guatemala, called El Navanjo, to the village of Santa Clara, which will open up the primeval forests and stock-raising lands of those districts; a line from La Maquina, also on the Central Railway of Guatemala, and 16 miles from the port of San José, to Santa Lucia and thence to Patulul, altogether 37 miles, which it is thought will again open up the rich coffee and sugar plantations thereabouts. In addition to the above the assembly has adopted a proposition for carrying out the construction of the "Northern Railway," to connect the port of San José, on the Pacific, with Port Barrios, in the Bay of Honduras, a distance of 180 miles. As regards British trade with the Central American Republics, a marked improvement is observable, especially in Costa Rica.

AUSTRALASIA AND PACIFIC ISLANDS.

Physical Geography and Climate of New South Wales.—The New South Wales Government has just published a second edition of Mr. H. C. Russell's pamphlet under this title. New South Wales divides itself naturally into three parts; the eastern Coast District 30 to 150 miles wide, the belt of Mountains and elevated plains 120 to 200 miles in breadth, and the Great Western Plains extending from the mountains towards the Darling River. Mr. Russell describes the physical features of each division, and, after enumerating the principal products, goes on to discuss the climatic conditions. Situated at the southern margin of the trades, the normal winds would be the south-east trade in the northern part of the colony, and the "brave west winds" in the southern, the

former extending further south during summer. The chief cause tending to modify this state of things is, of course, the immense land surface of central Australia, which, during summer, becomes heated to such a degree that, notwithstanding its comparatively low elevation, an indraught of air takes place towards it from all sides. The characteristic wind between the coast and the mountains during summer is, therefore, a kind of exaggerated sea-breeze, which is deflected by the upper current and the mountains from an easterly to a north-easterly wind. Cloud observations show a constant north-west upper current at heights greater than 4000 or 5000 feet, having a velocity of about 80 miles an hour. In the inland districts, light northerly and westerly winds prevail. Temperature means for ninety stations in the colony are given, although the number of years observations on which they are based is not stated. These show in a striking manner the low average and small annual range compared with corresponding northern latitudes, and the slowness of the transition from "coast" to "continental" climate due to the range of mountains. The mean temperature is compared with that of Europe by the novel device of printing the names of stations in New South Wales on a map of Europe beside European towns of the same mean temperature. This is of course not a just comparison of climates unless range as well as mean temperature could be shown. The rainfall statistics are naturally of special importance. In the coast districts the average fall ranges from 45 to 76 inches, along the top of the mountains from 30 to 40 inches, on the western slopes 20 to 30 inches, and on the flat country 10 to 20 inches. The popular reports as to droughts appear to be much exaggerated—the lowest rainfall at Sydney for any two consecutive years amounts to 74 per cent. of the average, a record which can be beaten in this country—and severe droughts are seldom of great extent. The frequent deficiencies in water-supply seem to arise largely from the want of natural means of conserving. Calculation has, however, shown conclusively that the precipitation is greatly in excess of the river drainage, and this has led to the sinking of wells, from which abundance of water has been obtained over the greater part of the inland districts.

POLAR REGIONS.

Proposed Expedition to the North Magnetic Pole.—Colonel Gilder having in 1890 urged the desirability of such an expedition, offering at the same time to take charge of it himself, a committee of the U.S. National Academy of Sciences was appointed to consider the question, and a preliminary report was soon afterwards drawn up. A discussion on the same subject took place in May last before the American Geographical Society, in which some of the leading authorities on terrestrial magnetism took part. The importance of a re-examination of the

region of the North Magnetic Pole as a help towards elucidating the phenomena connected with electricity and magnetism, was insisted on by all the speakers, and the objects to be kept in view by the expedition were clearly laid down. Foremost among these is of course the determination of the precise present position of the Pole, in order to decide whether it has moved since its discovery by Sir James Ross in 1831 on the west side of Boothia. Later observations make it probable that it has shifted some degrees further westward, to a point west of King William Land, somewhere in Victoria Strait; hence the explorer must be prepared to cross that strait and extend his survey to Victoria Land. It was pointed out by Mr. Schott and others, that though observations may not be obtained at the exact position of the Pole, the great desideratum is to secure them at stations *surrounding* that position as near as possible, by which the isoclinic curves of (say) 89° 30′, 89° 40′ and 89° 50′ could be laid down.

M. Rabot's Last Expedition to Jan Mayen and Spitzbergen.—M. Rabot, the well-known traveller in northern latitudes, accomplished, last summer, a voyage to the island of Jan Mayen and Spitzbergen, on board the *Manche*, to which brief allusion was made in the *Proceedings* for November last. The island of Jan Mayen had not been visited since 1882, the date of the Austrian Expedition, and M. Rabot was anxious to explore the freshwater "lakes" of the island. In the summer of 1891 he made an attempt to reach the island, but, when in sight of it, was compelled to retreat before the ice-floes. In order to reach a little lake situated in the centre of the island, M. Rabot and his companion, M. de Blanpré, had to cross a very mountainous tract, intersected by ravines and deep craters. The whole island is volcanic, but shows little signs of activity. The lake in question contains only a little water; it is simply a temporary pool, fed by the melting snow. The traveller also visited the lagoons on both sides of the island; these are not shown on recent Dutch maps, and their formation is apparently recent. The *Manche* subsequently proceeded to Spitzbergen, and a short stay was made at Recherche Bay. The glaciers in this region have retreated considerably. M. Rabot spent some time studying the fossil plants of the district, which are very numerous. Subsequently Ice Fjord was visited, and a short excursion made into the interior. About 19 miles from the coast there is a mountain, rising about 2500 feet above the sea-level, which the traveller ascended, and obtained a fine panoramic view over central Spitzbergen. The whole country was full of wild peaks, small table-lands, and rocky valleys. M. Rabot was struck with the rarity of the glaciers, and concludes that in Spitzbergen the large glaciers are only to be found on the coasts. This region is composed of plateaux of sedimentary origin, and presents a curious aspect, reminding one of the Colorado region of North America. The force of erosion

must have been great since the glacial epoch to have produced the results apparent to-day. Some shells were found at the foot of this mountain, showing that the bay must have at one time extended up to this point. The peak was named Milne Edwards.

The Antarctic Whalers.—A telegram from Monte Video on January 13th brings news of the progress of the Dundee whalers towards the Antarctic regions, and reports that all on board were well. The despatch of the fleet from Dundee in the beginning of September last was noticed in the *Proceedings* for 1892, p. 862. The *Balæna*, which was supplied with the most complete equipment for scientific work, reached Port Stanley, in the Falkland Islands, in the end of November. The *Active* arrived on December 8th and the *Diana* on the 11th. The *Polar Star*, which had not instructions to call at Port Stanley, was spoken off the River Plate on November 16th, all well. She reported having had light winds and calms, a state of weather which accounts for the protracted voyage of all the ships. We hope to receive letters giving some account of the preliminary scientific observations in a few weeks, although, of course, it will be several months before the results of the work in the Antarctic ice can be known.

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Atlantic Icebergs and the Climate of Europe.—Dr. H. Habenicht, of Gotha, has investigated (*Ausland*, 1892, No. 49) the question whether the climatological changes of Europe are due to cosmical or terrestrial influences. His explanation is in favour of the latter. South of Newfoundland the temperature of the Gulf Stream is influenced by the cold Labrador and Greenland currents, and by the huge icebergs which these currents carry southwards. In different years the number of the icebergs varies greatly, as has been shown for the last nine years in the "U.S. Pilot Charts of the North Atlantic Ocean." It is evident that the melting of these huge icebergs has a considerable influence on the surface-temperature of the Gulf Stream. Habenicht is, therefore, of opinion that the climatological changes of Europe are influenced by the annual number of icebergs which find their way into the Gulf Stream, and he supports his statement by comparing the mean quarterly temperatures of Europe with the fluctuating numbers of icebergs. He estimates the mean velocity of the Gulf Stream in the regions in question to be not more than 10 miles per diem (according to the Prince of Monaco's observations in the northern parts of the Atlantic it is still less). The icebergs reach the Gulf Stream usually between February and July. About six months later their influence on the climate of Europe becomes perceptible, and extends from

this time over a period of considerable length, as the following table shows:—

QUARTERLY MEAN CILMATE OF EUROPE.

Years.	Number of icebergs reported in the Gulf Stream in spring and summer of first-named year.	Winter, Dec. to Feb.	Spring, March to May.	Summer, June to Aug.	Autumn, Sept. to Nov.
1886–87	60	moderate	cold	moderate	cool
1887–88	220	moderate	cold	cold	cold
1888–89	10	mild	warm	warm	warm
1889–90	28	mild	warm	cool and rainy	mild, towards the end cold
1890–91	674	very cold	very cold	cold	warm
1891–92	141	moderate	cool	warm and very dry	warm

It cannot be denied that the coincidences are striking, and that we probably have here before us one of the factors which influence the climatological changes of Europe.

A new Observatory in Trans-Caucasia.—At the beginning of last autumn an astronomical observatory was opened at Abbas-Tuman (41° 46′ lat. and 60° 32′ long.) in the province of Kutais. It is situated at an altitude of 4236 feet above the sea-level. The cost of its erection has been defrayed by the Grand Duke Georges Mikhäilovich, and the management has been entrusted provisionally to Mr. Glazénap.

The Inconstancy of Latitude.—Dr. A. Marcuse read a report upon the geodetic expedition to the Hawaii Islands at the meeting of the Berlin Geographical Society, on December 3rd, 1892. Theoretical investigations have long ago given rise to the hypothesis of changes of latitudes. The first observational data with regard to a constant change in latitudes were obtained by Professor F. Küstner, who, from his observations at the Berlin Observatory, showed that the latitude of Berlin in the spring of the year 1882 was about two-tenths of a second less than at the same time of the year 1881. Similar results were derived from the observations at the Observatories of Pulkova and Gotha. In September, 1888, therefore, the Conference of the Permanent International Geodetic Commission, which was held at Salzburg, determined to undertake an investigation of this important question by means of simultaneous observations at the Observatories of Berlin, Potsdam, Prague, and Strasburg, which were commenced in January, 1889, and continued until April, 1890. The result of these observations was to show that in fact the latitudes of the places named were subject to periodical changes, the maxima of which occurred during the autumn, and the minima during the spring-time. The greatest variation

amounted to about one-half of a second, or in linear measure about 51 feet. Variations of this extent could not be neglected in accurate geodetical measurements where the calculations are often worked out to a few hundredths of a second. Theoretically, there are three possible reasons for variations in latitudes, viz., changes of gravity or of the plumb-line, the still unknown vibratory movements of the Earth's axis, and, lastly, variations in the position of the Earth's rotation-axis in the mass of the Earth itself. For the determination of this question it is necessary to have corresponding observations for latitude at two stations as nearly as possible 180° distant from each other. In case it should be, as in fact did happen, that the variation of latitude takes place simultaneously, but in an opposite sense, the third explanation is the only one possible. The Permanent Commission for Earth-Measurement determined, therefore, in January, 1891, to despatch an astronomical expedition to Honolulu for the purpose of taking observations for latitude as accurately as possible, simultaneously with observations at the Observatories of Berlin, Prague, and Strasburg. The expedition left Berlin on April 1st, 1891, and at Washington was joined by Mr. Preston, an officer of the Coast and Geodetic Survey of the United States. From the end of May, 1891, to May 1892, Dr. Marcuse recorded 1800 observations for latitude, with the result that if for Germany the geographical latitude increases, it decreases on the ante-meridian to exactly the same extent; thus furnishing an incontrovertible proof that the variations of latitude are caused by changes in the Earth's rotation-axis. The greatest possible precautions were taken to insure the accuracy of the measurements. The station was situated on a coral-rock on the sea-coast; the observation hut was specially constructed with double walls to keep off the intense rays of the sun, and, in order to guard against irregular refraction and the influence of temperature on the zenith telescope, the electric light was used for reading the instruments.

GENERAL.

Hannibal's Vinegar.—The recent revival, by Sir George Bowen, in the columns of the *Times*, of the old conjectural reading of *acuto*, "with a pick," in place of *aceto*, "with an acid," in Livy's account of Hannibal's difficulties in the passage of the Alps, furnishes an occasion for quoting from M. Lenthéric's recent work on the Rhône (Paris, Plon. 1892) an adequate and conclusive answer to the long array of critics who have superfluously striven to prove that Livy was writing at random, or wrote something else than the received text. M. Lenthéric writes (vol. i. pp. 89–91), "Some commentators, anxious to reconcile the text of Livy with their prejudices against an incident they regard as fabulous, have found nothing better than to alter the text itself and to replace the word *aceto* by the conjecture *acuto;* in this case *acutum* would simply indicate the sharp instrument which had served to penetrate the quartz or hard limestone of the Alps. Other critics—and these are the majority—have solemnly reproached Livy for having here as elsewhere written for effect, for having yielded to a desire to preserve a popular legend, to please the imagination of his readers and render his narrative more picturesque by enlivening it with a romantic fable, for having failed, in short, in that literary veracity which should be the characteristic of the historian. Modern science has taken up the

question anew, and unluckily for the critics, the pretended 'fable' of fire and vinegar can now be discussed with knowledge. As a matter of fact, it proves that the greater part of the classical writers who have touched on the famous passage of the Alps, have spoken of the simultaneous action of fire, cold water, and an acid. Further, the action of fire and water on rocks has been known from all time, and is pointed out by many ancient authors. Limestone is decomposed by the action of fire alone and changed into quicklime, which water dissolves very easily. Siliceous rock is not decomposed by fire—it splits either under fire or the subsequent effect of cold water. Fires are lighted round, or on the ledges of, the rock; as soon as the rock is sufficiently heated, cold water is poured in channels prepared beforehand so as to produce regular cleavages. It is exactly the practical application of the line of Lucretius—

"'Dissiliuntque fero ferventia saxa vapore.'

"Almost any liquid may replace water. Vinegar, *acetum*, or more generally acids, exercise a chemical action which did not escape the ancients. On this point the texts are precise. Pliny says of vinegar (Hist. Nat. i. xxiii., xxvii.), 'Saxa rumpit infusum quæ non ruperit ignis antecedens,'; (i. xxxiii., xxi.), Silices igne et aceto rumpunt.' Vitruvius (viii. c. 3) adds, 'non minus saxa silicea quæ neque ferrum neque ignis potest per se disolvere cum ab igne sunt percalefacta aceto sparso dissiliunt et dissolvuntur.' Dion Cassius may also be quoted (i. xxxv.): 'The city (Meleuthera, in Crete) was taken by treason, and held to ransom. The traitors saturated by night with vinegar a great tower with smooth surfaces, so as to render it friable.' These passages are conclusive, and place beyond doubt that it was the practice of the ancients, in order to break stone surfaces, to employ acids or saline solutions, the chemical effects of which they had observed, though they were probably unable to explain them. What was the exact nature of the liquid employed by Hannibal it is for chemistry to elucidate. Whatever it may have been, the old story of the classical historian which has met with so much incredulity among scholars and historians, is in accordance with the common practice of the age, as attested by adequate authority."

The part played by Mountains in the Distribution of Races.—M. Félix Regnault recently read a paper before the Paris Society of Anthropology, having been led to study the influence of mountains on races from observations made during a journey in India. In the case of a range sufficiently elevated and continuous to be a factor in the distribution of races, and where other causes do not intervene, he thinks that the following laws hold:—(1) The crest of a range never separates two races (apparent exceptions are due to the fact that states consider it necessary to occupy the slopes facing their respective territories for

defensive purposes); (2) where, as is usually the case, the slope is gradual on one side and steep on the other, the race on the side of the gradual slope surmounts the crest and occupies the steep slope also. M. Regnault gives many examples of this drawn from the ranges of Europe and Asia, *e.g.*, the French and German races in great part descend to the Italian foot of the Alps; the reason he gives is, the greater facility for gradual acclimatisation enjoyed by the dwellers at the foot of the gradual slope. In some of the instances brought forward, he could only point to a difference between the races of mountains and the plains at their foot, which he ascribes to difference of environment; while in the discussion which followed some speakers were inclined to lay more stress on the driving back to the mountains of inferior by superior races, as an explanation of certain phenomena of distribution, and took exception to the laws enunciated as being to any large extent generally applicable.

Two predecessors of Varenius.—Bernhard Varenius, author of that celebrated work 'Geographia generalis,' Amsterdam, 1650, has hitherto been regarded as the first to clearly define the difference between general and special geography. But A. Philippson, of Bonn, has now proved (*Ausland*, 1892, No. 52) that prior to Varenius, the works of Paul Merula ('Cosmographia generalis et Geographia particularis,' Amsterdam, 1636) and of David Christiani ('Systema Geographiæ generalis,' Marburg, 1645), contained the definitions and distinctions of general and of special geography. The former of these two writers deals with the hydrography and ethnography of our planet, with its dimensions, with the divisions and zones of its surface, and explains the most important definitions of general geography. Christiani makes a clear distinction between geography and chorography, and deals with mathematical geography, anemography (winds, etc.), and hydrography. As regards their cosmological views, it is interesting to note that both Merula and Christiani are opposed to the Copernican system.

Columbus as a Cosmographer.—At the Geographical Society of Berlin, on October 8th, 1892, Dr. K. Kretschmer read a paper on Christopher Columbus as a cosmographer, in the course of which he laid special emphasis on the fact that the great discoverer, down to the end of his life, did not come to understand the real significance of his discoveries, but always cherished the belief that he had discovered parts of Asia. This belief is conspicuous in all his letters and other writings, and he was unremitting in the trouble he took to obtain fresh evidence in support of this opinion. Like his contemporaries, he was little able to measure the far-reaching significance of his explorations. To discover India was his supreme desire, and every consideration which was urged against his views caused him the most bitter mortification, and was regarded by him as a direct personal affront.

CORRESPONDENCE.

The Nomenclature of the Karakoram Peaks.

SHALFORD PARK, GUILDFORD.
Jan. 6th, 1893.

SIR,—When reading the Geographical Notes in the December number of the *Proceedings* of the Geographical Society, 1892, my attention has been called to an extract from one of Mr. Conway's letters, headed "The Nomenclature of the Karakoram Peaks." It is to be regretted that so much reliance and importance has been placed on what a native drew on the sand, and the names he gave to various peaks. Natives are not always to be depended upon, not even when the topographical features are within the range of vision, and unless verified from other and independent information, names thus obtained cannot be trusted and placed on record, so well exemplified in this instance. The traveller must also have a considerable knowledge of the native languages, or he may be very much misled. It may not be too late to prevent these names thus put forward from being accepted by geographers, for fortunately I know both places well.

"Skeenmang" or "Skinmang," *vide* Engraved Atlas Sheet 44 A. N. W., is the name of a rather level piece of somewhat grassy ground at the great bifurcation of the Punmah Glacier; the name itself is expressive, and is derived from "*Skeen*," an ibex, and "*Mang*," a level open space in Balti. = "*Marg*" in Kashmiri, "*maidan*" in Hindustani, which disposes of it as a possible name for a peak.

Next we have "Chiring" put forward as the native name of K2, quite as inaccurate as the above. It is the name of another halting-spot at the end of a spur about half-way between Skeenmang and the Mustakh pass, as used about the period I was there (1860); it is situated above a very narrow part of the glacier, where its action on the sides is most apparent. ("*Chirna*," Hindustani, is to rend or tear.) All that portion of the glacier above this place, extending for six miles to the main watersheds, is called the "Chiring Ganse."

With regard to the remark on the differences to be found between the Government of India Survey Sheets, and the map published by the R.G.S., 1864, the latter was compiled from a photograph copy on same scale of my original Plane Table Survey; it very likely shows better in parts the peaks fixed by me, than the method of delineating the mountain ridges and spurs in the engraved sheets. Some features are sure to be lost in copying, and it must be borne in mind the copy of my original work, and lastly, that done by the engraver, were executed by men who had never seen the ground.

I am, sir,

Your obedient servant,

H. H. GODWIN-AUSTEN, Lt-Col.

To, The Editor of the *Geographical Journal*.

[In my brief letter, printed in the December number of the Royal Geographical Society's *Proceedings*, I reported an exact statement, taken down by Mr. Eckenstein from the lips of a native, and explained by a rough map drawn upon the ground by him, to the effect that Chiring is the native name of K^2, and Skinmang of the great peak immediately east of Captain Younghusband's Mustagh Pass. Colonel Godwin-Austen replies that these are the names of camping-grounds on the route

to his own Mustagh Pass, a fact of which I was aware, for they are marked on the map and referred to in his interesting paper, which I carried with me and frequently read. The route to that pass was also known to the native in question, and marked by him on his own rough map; but he put forward the names as those of peaks, and he also said (as I was informed) that these peaks were higher than Masherbrum, though which of the two was the highest he did not decide. He inclined to think Skinmang higher than Chiring. The fact that these names are also given or belong properly to pastures or camping-grounds is no sort of objection to their being also attached to peaks; in fact such a transfer of a name from pasture to peak is more of a rule than an exception. There is a Chiring pasture in the Dainyor Valley near Gilgit, and the outlier of Rakipushi above it is called by the same name. Mango* is the designation of a pasture about 10 miles up the right bank of the Biafo Glacier; it is also the name of the high peak opposite the foot of that glacier. The people of Askoley call it simply Mango; I could find none (out of some hundred I inquired of) that knew it as Mango Guzor, though that may nevertheless be its full name, as Chiring something may be the full name of K^2. The whole question of the naming of peaks has been fully discussed by Mr. Freshfield in the Royal Geographical Society's *Proceedings* of March 1886. The common course, both in the Alps and the Caucasus, has been for a name to be moved up from village, stream, or pasture, to a peak above. Thus from Matt (= meadow) we have Matterjoch, Matterhorn, and the like. Finsteraarhorn, Rheinwaldhorn, Saasgrat, Viescherhörner, Buet (Bovet, pasture, according to De Luc), are other Alpine examples. The map-maker as a rule adds the *mont* or *horn* to the old name. In the Caucasus the Russian surveyors call the peak over the Dych su (stream) Dych-tau, the peak above the Koshtan Glen (Kosh = chalet) Koshtantau, and so on. In the Bagrot Valley the natives told me that the name of a pasture belonged always to the height above it. If pressed they would add a particular designation. Thus Bari Rung is the Bari pasture, Bari Chish is the mountain above the pasture, but both were as a rule called simply Bari. I am sorry that, in maintaining the views I have always publicly upheld as to the proper system of mountain nomenclature, I am obliged to go counter to Colonel Godwin-Austen in a particular instance in which he is personally interested. He will, I think, understand that I am in no way wanting in appreciation of the extent and excellence of the work done by him under very difficult conditions in the Karakoram Range. The object of my journey was in fact to carry on that work in some parts and to complete it in others.—W. M. Conway.]

MEETINGS OF THE ROYAL GEOGRAPHICAL SOCIETY, SESSION 1892-93.

Fifth Ordinary Meeting, January 16th, 1893.—The Right Hon. Sir Mountstuart E. Grant Duff, G.C.S.I., President, in the Chair.

Elections.—*Robert Downs* (accidentally omitted from November list); *Charles Horace Andrews*; *George Lord Beeforth, J.P.*; *John Charles Blake*; *Alfred Clay*; *W. M. Conway, M.A.*; *Basil Bentham Dickinson*; *Commander F. G. Dundas, R.N.*; *Frank M. Dutton*; *Thomas Henry Evans*; *John Hadden Fisher, B.C.S.* (retired);

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* See derivation of this word in Colonel Godwin-Austen's letter above.

Joseph Franken; Raymond Godfrey; Shrimant Sampatrao K. Gaikwad; Matthew Wilks Geary; Albert Bruce Joy; Robert T. Hicks; Captain William Clive Hussey, R.E.; F. J. Jackson; A. J. Mounteney Jephson; George J. Kent; A. H. Savage Landor; Mrs. MacLennan; G. E. Marindin; Evelyn John Marsden; James A. Marshall; Alfred Fairfax Morgan; Staff-Commander E. C. Dubois Phillips, R.N.; James Robert Phillips; Alfred Raphael; Henry Alexander Sim; Frederick Smallman; James McLaren Smith, B.A.; Theodore Martin Teed, C.E.; Lieut.-Colonel N. L. Walford, R.A.; Major W. H. Waters, R.A.

The paper read was:—

"Journeys in Sarawak, Borneo." By Charles Hose.

There was an exhibition of photographs, manufactures, weapons, musical instruments, etc., in the tea-room.

GEOGRAPHICAL LITERATURE OF THE MONTH.

Additions to the Library.

By HUGH ROBERT MILL, D.Sc., *Librarian*, R.G.S.

EUROPE.

Alps. *Tour du Monde* **64** (1892): 417–432. **Durier.**

La Catastrophe de Saint-Gervais-les-Bains. Par M. Charles Durier.

An authoritative account of the nature and cause of the catastrophe which destroyed the houses of St. Gervais on July 12th, 1892, written by the vice-president of the French Alpine Club, and illustrated from photographs.

Alps and Apennines. *Bol. Soc. Geog. Italiana* **5** (1892): 946–964. **Marinelli.**

Sulla linea di divisione, da adottarsi nell' insegnamento, tra le Alpi egli Appennini. Relazione del Prof. G. Marinelli.

Apennines. *Globus* **62** (1892): 242–245, 264–267, 361–365. **Deecke.**

Der Appenin an der Irpinischen Wasserscheide nach seiner physischen Beschaffenheit und ökonomischen Bedeutung. Von W. Deecke, Greifswald. *With map.*

Danube. **Millet.**

The Danube from the Black Forest to the Black Sea. By F. D. Millet. London, Osgood, McIlvaine & Co., 1892: 8vo, pp. xii. and 327. *Illustrations. Price* 10*s.* 6*d.*

An illustrated account of a canoe trip down the Danube, with bright comments on the places, scenery and types of people met with.

England—Norfolk Broads. *Natural Science* **1** (1892): 347–355. **Gregory.**

The Physical Features of the Norfolk Broads. By J. W. Gregory, B.Sc.

A piece of sound local geography, illustrated by sketch maps and a photograph of characteristic scenery.

England—Yorkshire. **Leyland.**

The Yorkshire Coast and the Cleveland Hills and Dales. By John Leyland. With illustrations by Alfred Dawson and Lancelot Speed. London, Seeley & Co., 1892: 8vo, pp. 334. *Price* 7*s.* 6*d.*

Mr. Leyland has founded his picturesque historical account of Eastern Yorkshire firmly upon the geology and configuration of the district, showing full appreciation of the geographical principles which give unity and proportion to such a description.

Europe. **Block.**

L'Europe politique et sociale par Maurice Block. Deuxieme édition, ouvrage entièrement nouveau. Paris, Hachette et Cie., 1892: 8vo, pp. viii. and 586. *Maps. Price* 10*s.*

M. Block deals with the relative social conditions of the various European nations on a well-ordered plan, and fortifies his position with the necessary statistics. The Political conditions come first, viewed with regard to Organisation, Territory and population and Finance. Then the Economic conditions, including Agriculture, Industry, Commerce, and Means of Communication; and finally the Social conditions to which most detail is given, this section occupying half the book. Wherever it is possible the comparative statistics are presented diagrammatically and on maps, and the discussion is always clear and to the point. In the widest sense this may be looked on as a treatise on what is vaguely known in this country as the "commercial geography" of Europe.

France.—Arcachon. *Tour du Monde* **64** (1892): 353–384. **Kauffmann.**

Dans la Forêt d'Arcachon. Par M. P. Kauffmann.

An account of the mode of utilising the *landes*, with sketches of forest life.

Germany—Baden. **Neumann.**

Die Volksdichte im Grossherzogtum Baden. Eine anthropogeographische Untersuchung. Von Dr. Ludwig Neumann, Professor der Geographie an der Universität Freiburg. Stuttgart, Engelhorn, 1892: 8vo, pp. 172. *Price* 9*s.* 6*d. With two maps.*

Part I. of Vol. VII. of Kirchhoff's Forschungen zur Deutschen Landes- und Volkskunde.

Germany—Saxony. **Simon.**

Die Verkehrsstrassen in Sachsen und ihr Einfluss auf die Städteentwickelung bis zum Jahre 1500 von Dr. A. Simon, Seminarlehrer in Auerbach. Stuttgart, Engelhorn: 8vo, pp. 99. *Price* 4*s.*

Part II. of Vol. VII. of Kirchhoff's series.

Greece. **Diehl.**

Excursions in Greece to Recently-Explored Sites of Classical Interest: Mycenæ, Tiryns, Dodona, Delos, Athens, Olympia, Eleusis, Epidaurus, Tanagra. A popular account of the results of recent excavations. By Charles Diehl. Translated by Emma R. Perkins. With an Introduction by Reginald Stuart Poole, LL.D. London, Grevel & Co., 1893: 8vo, pp. xxiv. and 408. *Price* 7*s.* 6*d. Presented by the Publishers.*

An admirable summary for visitors to Greece who wish to acquaint themselves with historic and prehistoric sites, without the laborious study of archæological works.

Holland—The Zuiderzee. *Globus* **63** (1893): 6–10. **Hansen.**

Die Trockenlegung der Zuiderzee. Von Dr. R. Hansen. *With map.*

Montenegro. *Deutsche Rundschau* **15** (1893): 97–106, 166–173. **Hassert.**

Eine Fusswanderung durch Montenegro. Von Dr. K. Hassert. *Map and illustrations.*

Norway. **Reusch.**

Bömmelöen og Karmöen med omgivelser geologisk beskrevne af dr. Hans Reusch. Kristiania Steensballes, 1888: 4to, pp. 422. *Maps and plates.*

An account of the geology of the islands at the mouth of the Hardanger Fjord, the study of which has thrown much light on the origin of metamorphic rocks. The book is provided with an English summary of the contents.

Rhone. **Lentheric.**

Le Rhone, Histoire d'un fleuve. Par Charles Lentheric, Ingénieur en chef des ponts et chaussées. Paris, Plon, Nourrit et Cie., 1892: 2 vols., pp. I. viii. and 557, II. 585. *Price* 15*s.*

The author disclaims any intention of writing a treatise for specialists, but he has produced a most comprehensive description in popular form of the history of the River Rhone. While necessarily adopting some debatable theories as if they were

proved, his method has the advantage of giving in a continuous narrative the main features of the Rhone Valley prior to, during and since the Glacial Period. Physical and human interest are interwoven, a chapter on the ancient roads connected with the valley, leading to an account of the Rhone and its surroundings during historical times, and of the peoples who lived in or passed through its valleys. The concluding chapter deals with the modern river in its physical and practical aspects.

Rumania. *Bul. Statist. Gen. Romaniei* I. (1892): 1–200. ———

Asupra Populationei Romaniei.

A full discussion of the number and nature of the population of Rumania from 1849 to 1890.

Scotland. **Annandale.**

Scotland in Prehistoric Times: a brief summary of what is known regarding the country and its inhabitants in times anterior to the Roman invasion. Based on the most recent researches. By Charles Annandale, M.A., LL.D. London, Blackie & Son, 1892: large 8vo, pp. 38. *Illustrations.* *Presented by the Publishers.*

The introductory chapter to 'A History of the Scottish People from the Earliest Times' (shortly to be issued), by the Rev. Thomas Thomson.

Spain, Dictionary of. **Castillo.**

Gran Diccionario Geográfico, estadistico é histórico de España y sus Provincias de Cuba, Puerto Rico, Filipinas y posesiones de Africa. Esta obra se publica bajo la dirección de D. Rafael del Castillo. Tomo III. [Moa-Sut.] Barcelona, 1891: 4to, pp. 715. *Map.*

Switzerland. **Graf.**

Cartes de Parcelles plus ou moins grandes du territoire suisse. Publié par le Bureau Topographique Federal. Redigé par le Prof. Dr. J. H. Graf. Berne, Wyss, 1892: 8vo, pp. 171–335. Price 3*s.* *Presented by the Publisher.*

The second part of the valuable official bibliography of works relating to Switzerland.

Turkey—Mount Athos. *Jahresbericht Geog. Ges. München* **14** (1890–91): 75. **Dühmig.**

Der Berg Athos. Von Karl Dühmig.

General description of the Chalkidike, and narrative of a visit to Mount Athos.

ASIA.

India. **Führer.**

The Monumental Antiquities and Inscriptions in the North-Western Provinces and Oudh. Described and arranged by A. Führer, PH.D. (Archæological Survey of India). Allahabad, 1891: large 4to, pp. iv. and 425 *Presented by the Secretary of State for India.*

Classified lists of monumental inscriptions and antiquities.

India. **Le Bon.**

Les Monuments de l'Inde. Par le Dr. Gustave Le Bon, chargée d'une mission archéologique dans l'Inde par le Ministre de l'Instruction publique. Ouvrage illustré d'environ 400 figures; heliotypies, dessins, cartes et plans exécutées apres les photographies et les documents de l'auteur. Paris, Firman-Didcot et Cie., 1893: large 4to, pp. (*text*) 254. *Price* 100*s.*

Indo-China. *Bull. Soc. Geog. Paris* **13** (1892): 216–249, 339–374. **Aymonier.**

Une mission en Indo-Chine (Relation sommaire). Par Etienne Aymonier.

Kashmir. **Duke.**

Ince's Kashmir Handbook: a Guide for Visitors. Rewritten and much enlarged. By Joshua Duke. Calcutta: Thacker, Spink & Co., 1888: 12mo, pp. 337. *Maps.* *Price* Rs. 6.

Appendix to Ince's Guide to Kashmir. Rawal Pindi to Srinagar: a detailed account of the new Jhelum Valley road. Together with a brief Note of five other routes leading into the valley. Calcutta, Thacker, Spink & Co., 1892: 12mo, pp. 84. *Price* R. 1. 8. *Presented by the Publishers.*

Worthy to rank with Bædeker's European guide-books for full information, conciseness, and clear arrangement. The maps are of special value.

Oxus. *Bull. Soc. Geog. Paris* **13** (1892): 281–315. **Blanc.**

L'Hydrographie du bassin de l'ancien Oxus. Par Edouard Blanc. *With map.*

The collection of ancient maps of Asia, shown at the Moscow Exhibition of 1892, is here utilised along with other data and the author's personal explorations.

Pamirs. *Bull. Soc. Geog. Paris* **13** (1892): 316–338. **Capus.**

Observations et notes météorologiques sur l'Asie centrale, et notamment les Pamirs. Par Guillaume Capus. *With map.*

Persia—Susa. **Dieulafoy.**

Marcel Dieulafoy. L'Acropole de Suse d'apres les fouilles exécutées en 1884, 1885, 1886, sous les auspices du Musée du Louvre. Ouvrage contenant 386 gravures insérées dans le texte avec 4 planches en noir et 12 planches en couleurs. Paris, Hachette et Cie., 1893: large 4to, pp. 448. *Price* 80*s.*

This magnificent work will be specially reviewed.

Siam—Bangkok. ——

The Directory for Bangkok and Siam for 1892. London, F. Algar; Singapore, Sayle & Co.: sm. 4to, pp. iii., 334, and 32. *Presented by the Compiler.*

A plan of Bangkok is given, showing the roads, canals, and chief buildings.

Sumatra. *Bijdrag. Volkenkunde Nederl.-Indie* **7** (1892): 609–621. **Bevervoorde.**

Een Bezoek aan de Bataksche Hoogvlakte. Door K. Th. Engelbert van Bevervoorde.

An account of the Battak Tableland in Northern Sumatra.

Sumatra. *Bijdrag. Volkenkunde Nederl.-Indie* **7** (1892): 330–623. **Kielstra.**

Sumatra's W. atkust sedert 1850. Door E. B. Kielstra.

History of the exploration and development of the west coast of Sumatra from 1850 to 1890.

Syria. *Miss. Catholiques* (1892): 382, 395, 419, 432, 439, 457, 468, 482, 492, 505, 515, 537, 562, 577, 588, 596, 610, 621, 647. **Jullien.**

Voyage dans la Syrie Septentrionale aux ruines chrétiennes des IV^e^, V^e^, et VI^e^ siècles. Par le R. P. Jullien.

Illustrated by some good pictures of early Christian architecture.

AFRICA.

Africa. **Brown.**

The Story of Africa and its Explorers. By Robert Brown, PH.D. Vol. I.—The Guinea Traders; The Corsairs of Africa; The Tale of Timbuctoo; The Niger. London, &c., Cassell & Co., 1892: 4to, pp. viii. and 312. *Illustrations. Price* 7*s.* 6*d. Presented by the Publishers.*

This work is issued in monthly parts. Part I. was noticed in the *Proceedings* for 1892, at p. 260. It is a good, popular account of the subjects dealt with, with excellent illustrations.

East Africa. **Mandat-Grancey.**

Souvenirs de la Côte d'Afrique. Madagascar—Saint-Barnabé. Par le Baron E. de Mandat-Grancey. Paris, E. Plon, Nourritt & Co., 1892: 12mo, pp. 308. *Illustrations.*

Egyptian Sudan. **Chaillé-Long.**

L'Egypte et ses provinces perdues. Par le Colonel Chaillé-Long Bey. Paris, Libraire de la Nouvelle Revue, 1892: 8vo, pp. 327. *Price* 3 fr. 50 c.

Contains some remarkable adventures of the author while acting as a subordinate of Gordon in the Equatorial province, and in command of an expedition to the Jub.

German East Africa. *Mitt. Deutschen Schutzgebieten* **5** (1892): 191–203. **Herrmann.**

Ugogo, das Land und seiner Bewohner. Von Lieutenant Herrmann.

German East Africa. *Mitt. Deutschen Schutzgebieten* **5** (1892): 101–134. **Stuhlmann.**

[A series of short papers, with a map illustrating Dr. Stuhlmann's travels between Tabora and the Victoria Nyanza in 1890.]

German East Africa. **Schmidt.**

Geschichte des Araberaufstandes in Ost-Afrika. Seine Entstehung, seine Niederwerfung und seine Folgen. Von Rochus Schmidt. Frankfurt a. Oder, Trowitzsch & Son [1892]: 8vo, pp. 360. *Map. Price* 4*s.* 6*d.*

German West Africa. *Mitt. Deutschen Schutzgebieten* **5** (1892): 211–242. **Danckelmann.**

Weitere Beiträge zur Klimatologie des Schutzgebietes von Kamerun. Von Dr. von Danckelmann.

Tables and discussion of the meteorological observations made in the Kameruns during the last three years.

German West Africa—Kamerun. **Morgen.**

Durch Kamerun von Süd nach Nord. Reisen und Forschungen im Hinterlande 1889 bis 1891. Von C. Morgen. Leipzig, Brockhaus, 1893: 8vo, pp. 390. *Price* 8*s.* 6*d. Map and illustrations.*

Lieutenant Morgen's route led inland from Kribi, northward through the Ngaundere country and Adamawa to Ibi on the Benue, whence he returned by that river and the Niger. His journey is described with the aid of numerous excellent illustrations, and there are appendices on the meteorology of the Kameruns, on the imports and exports of that colony, and on the new German rules for phonetically rendering names.

North-east Africa. **Fumagalli.**

Bibliografia Etiopica. Catalogo descrittivo e ragionato degli scritti pubblicati dalla invenzione della stampa fino a tutto il 1891 intorno alla Etiopia e regione limitrofe. Redatto da Giuseppe Fumagalli. Milano, U. Hoepli, 1893: 8vo, pp. xi. and 288. *Price* 9*s.*

A classified catalogue of nearly three thousand works dealing with the regions of north-eastern Africa where Italian interests are predominant, compiled by the Librarian of the National Library of Milan.

Sahara. *Bull. Soc. Geog. Paris* **13** (1892): 375–392. **Fabert.**

Voyage dans le pays des Trarzas, et dans le Sahara occidental. Par Léon Fabert. *With map.*

An abstract was given in the *Proceedings* for 1892, p. 338.

Sudan. *Proc. Roy. Artillery Inst.* **19** (1892): 675–694. **Wingate.**

The Sudan, Past and Present. By Major F. R. Wingate, D.S.O., R.A.

Zimbabwe. *Pet. Mitt.* **38** (1892): 283–286. **Schlichter.**

Die Ruinen von Simbabye. Von Dr. Heinrich G. Schlichter.

A discussion of the orientation and age of the ruins.

NORTH AMERICA.

United States—Arid Region. **Redway.**

The Influence of Rainfall on Commercial Development: a Study of the Arid Region. By Jacques W. Redway: 8vo, pp. 14. *Reprinted from the 'Proceedings' of the Engineers' Club of Philadelphia, October* 1892. *Presented by the Author.*

Vinland. **Power.**

The Whereabouts of Vinland. By Hon. L. G. Power, Halifax, N.S.: 4to, pp. [19]. *Illustrations. From the 'New England Magazine' for Oct.* 1892.

The site of Leif Erikson's house is supposed by Mr. Power to have been on Hamilton's Inlet, in Labrador, and arguments in support are brought forward.

CENTRAL AND SOUTH AMERICA.

Amazons. **Bates.**

The Naturalist on the River Amazons. By Henry Walter Bates, F.R.S. With a memoir of the author by Edward Clodd. London, John Murray,

1892: 8vo, pp. lxxxix. and 395. *Maps and illustrations. Presented by the Publisher.*

A reprint in one volume of the unabridged first edition of this masterpiece of scientific travel. Since its first publication thirty years ago the book has been accepted as a classic, and nothing farther can now be said save in the way of hearty welcome in its new form. A brief but deeply appreciative memoir of the author is prefixed, and Mr. Clodd has incorporated with it a number of letters of great permanent value which illustrate the rise and progress of the friendship which bound Bates to Darwin, Hooker, and other leaders of biological science. We cannot but regret, however, the somewhat unhappy portrait, the pained expression of which contrasts unfavourably with that in the photograph published in the *Proceedings* for May, 1892.

Andes. *Globus* **63** (1893): 1–6, 32–35. **Brackebusch.**

Die Penitentesfelder der argentinischen Kordilleren. Von Prof. Dr. Ludwig Brackebusch. *Illustrations.*

A summary of this paper appears elsewhere.

Brazil. **Ehrenreich.**

Beiträge zur Völkerkunde Brasiliens. Von Dr. P. Ehrenreich. Berlin, Spemann, 1891: fo, pp. 80. *Plates. Presented by the Königlichen Museum für Völkerkunde at Berlin.*

This issue includes an account of the Karaya people of the Rio Araguaya, and of some of the people of the Rio Purus, copiously illustrated with photographs and woodcuts.

Brazil—San Paulo. *Pet. Mitt.* **38** (1892): 273–283. **Lange.**

Aus dem Staate São Paulo, Brasilien. Von Prof. Dr. Henry Lange. *Maps.*

An account of the recent work of the Geographical and Geological Commission.

Central American names. **Pector.**

Considérations sur quelques Noms Indigènes de localités de l'Isthme Centre-Américain, par Désiré Pector. Paris, E. Leroux, 1892; large 8vo, pp. 23. *Presented by the Author.*

Costa Rica. *Annales Inst. Fisico-geog. Costa Rica* **3** (1892): 57–106. **Pittier.**

Viaje de Exploracion al Valle del Rio Grande de Terraba. Por H. Pittier.

Narrative of Dr. Pittier's scientific exploring journey in 1891, with an orographical map of Costa Rica.

Haiti. **Tippenhauer.**

Die Insel Haiti. Von L. Gentil Tippenhauer. Leipzig, Brockhaus, 1893: fo, pp. xviii. and 693. *Maps and plates. Price* 34*s.*

An authoritative work which will be specially reviewed.

Nicaragua. **Pector.**

Congrès International des Sciences Géographiques tenu a Paris en 1889. Exposé sommaire des voyages et travaux géographiques au Nicaragua dans le cours du XIX^e^ siècle, par Désiré Pector. Paris, Bibl. des *Annales Économiques*, 1891: large 8vo, pp. 8. *Presented by the Author.*

Tierra del Fuegia. **Hyades and Deniker.**

Mission scientifique de Cap Horn 1882–1883. Tome VII., Anthropologie, Ethnographie. P. Hyades, J. Deniker. Paris, Gauthier-Villars et Fils, 1891: 4to, pp. viii. and 424. *Map and plates.*

This volume closes the records of the French Scientific Mission to Cape Horn with a careful study of the tribes inhabiting the dreary Archipelago of Tierra del Fuegia. There are admirable photographic illustrations.

Venezuela. **Bolet-Peraza.**

The Republic of Venezuela. By Don Nicanor Bolet-Peraza. 4to, pp. [15]. *Illustrations. From 'The New England Magazine,' October* 1892.

AUSTRALASIA AND PACIFIC ISLANDS.

Australasia. **Lendenfeld.**

Australische Reise von R. v. Lendenfeld. Innsbruck: Verlag der Wagnerschen Universitäts Buchhandlung. 1892: large 8vo, pp. ix. and 325. *Price* 8*s.* 6*d.* *Illustrations.*

A general description of the physical features and natural productions of Australia and New Zealand. The views of the New Zealand glaciers and snow-peaks are magnificently reproduced, and the account of Antipodean mountaineering, including the first ascent of the Hochstetter Dome, is authoritative and full of interest.

New South Wales. **Russell.**

Physical Geography and Climate of New South Wales. By H. C. Russell, F.R.S. Second edition. Sydney, Charles Potter, 1892: 8vo, pp. 35, *maps.* *Presented by the Government of New South Wales.*

Queensland—Magnetic Island. **Maitland.**

The Physical Geology of Magnetic Island (Report by A. Gibb Maitland, Assistant Government Geologist, with two geological maps and two plates of sections), 1892: fo, pp. 8. *Presented by the Government of Queensland.*

This island was named by Cook in 1770 on account of the remarkable deflection of the compass observed on approaching it. The Report, which is an interesting contribution to the work begun by Rücker and Thorpe in this country, makes it evident that the magnetic effects are due to the exceptional number of basic volcanic dykes containing magnetite, a mineral which is also abundant in the sand on the beach.

Solomon Islands. *Globus* **63** (1893): 41–43, 62–66. **Seidel.**

Die Salomo-Insel Malaita. Von H. Seidel. *Maps and illustrations.*

A compilation likely to be useful on account of the number of authorities cited.

POLAR REGIONS.

North Greenland. **Heilprin.**

The Peary Relief Expedition. By Angelo Heilprin. 4to, pp, 24. *From 'Scribner's Magazine,' January,* 1893. *With illustrations.*

MATHEMATICAL AND PHYSICAL GEOGRAPHY.

Age of the Earth. *American Journ. Science* **45** (1893): 1–20. **King.**

The Age of the Earth. By Clarence King.

A re-discussion of the measurement of Earth-age by rate of cooling of diabase, which, combined with other considerations, gives 24 million years as the maximum.

Geodesy. *American Journ. Science* **45** (1893): 33–53. **Woodward.**

Preliminary Account of the Iced-Bar Base Apparatus of the United States Coast and Geodetic Survey. By R. S. Woodward.

A new method of measuring bases by means of bars kept by melting ice at the temperature of 32° when in use.

Geodesy. *Revue de Geog.* **16** (1893): 43–55. **Lallemand.**

Les Progrès réalisés en France dans la Mesure des Altitudes, et la détermination du niveau des mers. Par Ch. Lallemand.

A lecture given at the Sorbonne before the French Topographical Society on November 13th, 1892, by the chief of the French Survey.

Geysers. *American Journ. Science* **45** (1893): 54–60. **Graham.**

Some Experiments with an Artificial Geyser. By James C. Graham.

Lakes. *Natural Science* **1** (1892): 117–123. **Reid.**

Great Lakes. By Clement Reid, F.G.S.

A contribution to the theory of the origin of the great lakes of America and Africa.

Lakes. *Mitt. Geog. Ges. Wien* **35** (1892): 471–539. **Damian.**

Seenstudien. Von Josef Damian, in Trient. I. Seen in der Umgebung von Trient, westlich der Etsch. *Maps and diagrams.*

A comprehensive study of the lakes near Trent, with references to earlier workers.

Meteorology. **Nursingrow**

G. v. Juggarow Observatory, Duba Gardens, Vizagapatan. Results of Meteorological Observations, 1891. With an Introduction, by A. V. Nursingrow. Calcutta, 1892: 12mo, pp. 184, portraits, etc. *Presented by A. V. Nursingrow, Esq.*

Mountains. *Bol. Soc. Geog. Italiana* **5** (1892): 931–946. **Marinelli.**

Sui criterî da seguirsi per la ripartizione dei sistemi montuosi nella Geografia in generale e nella Geografia didattica in particolare. Relazione del Prof. G. Marinelli.

On the general principles to be followed in the sub-divisions of mountain systems, a paper read to the Genoa Geographical Congress.

Ocean Basins. *Natural Science* **1** (1892): 418–426. **Wallace.**

The Permanence of the Great Oceanic Basins. By Dr. A. Russel Wallace.

Ocean Basins. *Natural Science* **1** (1892): 508–513. **Jukes-Browne.**

The Evolution of Oceans and Continents. By A. J. Jukes-Browne, B.A.

Submarine Cañons. *Jahresbericht Geog. Ges. München* **14** (1890–91): 21–52. **Linhardt.**

Ueber unterseeische Flussrinnen. Von Dr. Ernst Linhardt.

The observations on submarine hollows in continuation of the course of rivers made by Forel, Buchanan, the United States' Coast Survey Officers, and others, are here brought together, and the origin of the feature discussed.

Winds. **Duponchel.**

La Circulation des Vents et de la Pluie dans l'Atmosphere. Par A. Duponchel. Paris, Camut, 1892: 8vo, pp. 111. *Presented by the Author.*

A new but unproved theory of atmospheric circulation.

GENERAL.

Bibliography. **Jordell.**

Catalogue Général de la Librairie Française, continuation de l'ouvrage d'Otto Lorenz (Période de 1840 à 1885: 11 volumes). Tome Douzième (Période de 1886 à 1890). Rédigé par D. Jordell. Quatrième fasc. Meynard—zuine. Paris, Nilsson, 1892: large 8vo.

Bibliography. **Löwy.**

Catalogue of Hebraica and Judaica in the Library of the Corporation of the City of London. With a Subject Index by the Rev. A. Löwy. London, 1891: large 8vo, pp. xi. and 231. *Presented by the Library Committee of the Corporation of the City of London.*

Bibliography. ——

Quatrième Centenaire de la Découverte de l'Amérique. Catalogue des Documents Géographiques exposés a la Section des Cartes et Plans de la Bibliothèque Nationale. Paris, J. Maisonneuve, 1892: large 8vo, pp. vii. and 77. *Price* 3*s.* 6*d.*

Biographical Dictionary. ——

Dictionary of National Biography. Edited by Sidney Lee. Vol. XXXII. Lambe—Leigh; Vol. XXXIII. Leighton—Llwelyn. London, Smith, Elder, & Co., 1892, 1893: large 8vo, pp. (vol. XXXII.) vi. and 445; (Vol. XXXIII.) vi. and 447. *Price, each vol.*, 15*s.*

The following names, more or less connected with discovery and travel, appear among the notices in these volumes:—John Lambert, by T. Seccombe; William Lambton, by H. M. Chichester; Sir James Lancaster, by Prof. J. K. Laughton; John

Lander, and Richard Lemon Lander, by H. M. Chichester; William Landsborough, by G. C. Boase; Edward William Lane, by S. Lane-Poole: Sir Ralph Lane, by Prof. J. K. Laughton; John Dunmore Lang, by G. C. Boase; R. G. Latham, M.D., by the late G. T. Bettany: C. J. Latrobe; P. E. Laurent, by W. Wroth; John Lawson, by T. Seccombe; W. M. Leake, by W. Wroth; Arthur Leared, M.D., by G. Goodwin; John Ledyard, by Prof. J. K. Laughton; Mrs. Sarah Lee, by the Rev. M. G. Watkins; Sir J. H. Lefroy, by Colonel R. H. Vetch, R.E.; François Lequat, by Capt. S. P. Oliver; F. W. L. Leichhardt, by G. C. Boase; Charles Leigh, by Prof. J. K. Laughton; William Light, by H. M. Chichester; William Lithgow, by F. H. Groome; Charles Livingstone, and David Livingstone, by Colonel R. H. Vetch, R.E.; and J. A. Lloyd, by H. M. Chichester.

Biography. *Deutsche Rundschau* **15** (1892): 183–185. **W. W.**

Dr. Theodor Menke. *With portrait.*

Columbus. **Adams and Wood.**

Columbus and His Discovery of America. By Herbert B. Adams PH.D., and Henry Wood, PH D., Baltimore. The Johns Hopkins Press, 1892: 8vo, pp. 88.

One of the Johns Hopkins University Studies of Historical and Political Science.

Columbus. **Rein.**

Columbus und seine vier Reisen nach dem Westen. Natur und hervorragende Erzeugnisse Spaniens. Von Dr. Johannes Rein, Professor der Geographie, Bonn. Leipzig, Engelmann, 1892: 8vo, pp. 244. *Illustrations and maps. Presented by the Author.*

The account of Columbus' voyages is interspersed with chapters on the province of Huelva, and on the physical and industrial geography of modern Spain.

Columbus. **Winsor.**

America Prefigured. An Address at Harvard University, October 21st, 1892. By Justin Winsor. Cambridge (Mass.). *Privately printed*, 1893: small 4to, pp. 11. *Presented by the Author.*

Educational. *Bol. Soc. Geog. Italiana* **5** (1892): 965–974. **Porena.**

Della vicende e degli ordinamenti dell' insegnamento geografico nelle scuole primarie dalla costituzione del Regno, e proposte dei mezzi per migliorarlo. Relazione del Professor F. Porena.

On elementary geographical teaching in Italy.

General Geography. **Reclus.**

Nouvelle Géographie Universelle. La Terre et les Hommes, par Elisée Reclus XVIII., Amerique du Sud. Les regions Andines, Trinidad, Vénézuéla, Colombie, Ecuador, Pérou, Bolivie et Chili. Paris, Hachette et Cie, 1893: 4to, pp. 848.

In this volume the greater part of South America is described with the usual lucidity of style, and illustrated by the usual profusion of maps and pictures characteristic of the whole work.

Historical. **Berger.**

Geschichte der Wissenschaftlichen Erdkunde der Griechen. Von Dr. Hugo Berger. Vierte Abtheilung. Die Geographie der Griechen unter dem Einflusse der Römer. Leipzig, Von Veit & Co., 1893: 8vo, pp. xii. and 170.

The previous parts of this work were noticed in the *Proceedings* for 1892 at p. 505. The present part treats of the geography of the Greeks at the time of the Roman sway.

Historical. **Wagner.**

Die dritte Weltkarte Peter Apians v. J. 1530 und die Pseudo-Apianische Weltkarte von 1551. Vorläufige Mitteilung von Hermann Wagner. Small 4to pp. [32.] *From the Göttingen Nachrichten for December* 28, 1892. *Presented by the Author*

Historical Geography. *Bol. Soc. Geog. Italiana* **5** (1892): 853-865. **Levasseur.**

Sur l'expansion de la race européene hors d'Europe depuis la découvert de l'Amerique. Communication de M. E. Levasseur.

A paper read to the Geographical Congress at Genoa.

Historical Geography. **Levieux.**

Considerations geographiques sur les centres de Civilisation. Par Fernand Levieux. Bruxelles: Vanderauwera, 1892: 8vo, pp. 16. *With map. Presented by the Author.*

Historical Geography. **Noël.**

Histoire du Commerce du Monde depuis les temps les plus reculés. Par Octave Noël, Professeur a l'Ecole des hautes études commerciales. Paris, Plon, Nourrit et Cie., 1891: small 4to, pp. xxvii. and 332.

Treats of ancient times and the Middle Ages, with numerous illustrative maps.

Navigation. *Ausland* **65** (1892): 769-74, 791-96, 809-13, 824-30, 835-43. **Gelcich.**

Beiträge zur Geschichte der oceanischen Schiffahrtregeln und Segelhandbücher. Ein Beitrag zur Geschichte der maritimen Geographie. Von Eugen Gelcich.

A sketch of the history of maritime enterprise down to Maury's time.

Norddeutscher Lloyd. **Lindeman.**

Der Norddeutscher Lloyd. Geschichte und Handbuch. Bearbeitet von Dr. Phil Moritz Lindeman Bremen: Schünemann. 1892: 8vo, pp. xxi. and 487. *Tables, maps, and illustrations. Presented by the Author.*

A handsome volume, with maps of the routes followed by the company's steamers, and pictures and plans of the principal harbours of the world.

Oriental Literature. **Max Müller.**

The Sacred Books of the East. . . . Edited by F. Max Müller. Vols. XXX., XXXII., and XXXVII. Oxford, the Clarendon Press, 1891-1892: 8vo, pp. (Vol. XXX.) xxxix. and 376; (Vol. XXXII.) cxxv. and 556; (Vol. XXXVII.) i. and 506. *Presented by the Secretary of State for India.*

NEW MAPS.

By J. COLES, *Map Curator*, R.G.S.

EUROPE.

Austria-Hungary. **Military Geographical Institute, Wien.**

Hypsometrische Karte von Oesterreich-Ungarn. K. u. k. militärgeographisches Institut. Wien. Sheets:—B. 2, Prag, Eger, Budweis, Linz, München, Regensburg; B. 3, Laibach Villach, Kufstein, Belluno; B. 4, Pola, Zara, Comacchio; C. 2, Brünn, Troppau, Neutra; C. 3, Wien, Graz, Budapest; C. 4, Agram, Brod, Esseg, Glina, Knin, Sarajevo; C. 5, Ragusa, Mostar; D. 2, Krakau, Przemyśl, Jaroslau, Kaschau, Leutschau; D. 3, Szegedin, Grosswardein Oarad, Erlau, Szolnok; E. 2, Tarnopol, Brody, Stryj, Czernowitz; E. 3, Klausenburg, Máramaros-Sziget, Tölgyes. Scale 1: 750,000 or 10·3 geographical miles to an inch. *Price 2s. each sheet.*

This map is in course of publication, and is based on the Map of Central Europe, recently completed by the same department. In the present instance the sheets are orographically coloured in different shades, indicating elevations varying from 150 metres to 300 metres. Altitudes are also shown by contour lines, and wherever these touch the margin of the map, their values are given in figures. All roads are shown by red lines, railways black, and rivers blue. The colours used are remarkably well chosen, and the map as a whole reflects credit on all concerned in its production.

Austria-Hungary. **Tipser.**

Artaria's Universal-Administrativ-Karte der Oesterreich-ungarischen Armee mit der Eintheilung des Reiches in die Territorial-und Ergänzungsbezirke des k. u. k. Heeres und der Kriegsmarine, der k. k. und k. ungarischen Landwehren und des Landsturmes. Bearbeitet von Oberst Tipser. Scale 1 : 1,500,000, or 20·4 geographical miles to an inch. Mit Beilage: Uebersicht der regelmässigen Ergänzungen an Truppen, welche die destehenden Stellungsbezirke Oesterreich-Ungarns für das stehende Heer, für die Kriegsmarine, für die Landwehr und für den Landsturm zu leisten haben. Zweite Auflage. Wien, Verlag und eigenthum von Artaria & Co., 1893. *Presented by the Publishers.*

Austria-Hungary. **Artaria.**

Artaria's Eisenbahn-u Post-Communications-Karte v. Oesterreich-Ungarn 1893. Scale 1 : 700,000, or 23·3 geographical miles to an inch. Artaria & Co., Wien. *Price* 2*s*. *Presented by the Publishers.*

England and Wales. **Ordnance Survey.**

Publications issued since December 15th, 1892.

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ENGLAND AND WALES: 155, 184, 217, 266, 280, 282, 296, 349, 350, engraved, 1*s*. each.

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AFRICA.

Equatorial Africa. **Philip.**

A Mission Map of Equatorial Africa, showing more especially the Stations of the Baptist Missionary Society. Scale 1 : 1,650,000, or 23 geographical miles to an inch. G. Philip & Son, London, 1892. On roller, varnished. *Presented by the Baptist Missionary Society.*

This is 'Philip's Map of Equatorial Africa, showing Stations of the Missionary Societies,' with the stations of the Baptist Missionary Society underlined in red, and a change in the title.

South African Republic. **Troye.**

Troye's Map of the Transvaal or South African Republic. Scale 1 : 500,000, or 6·8 geographical miles to a inch. Published for Fehr & Dubois. Pretoria, 1892.

This is a six-sheet map of the Transvaal or South African Republic. The districts Heidelberg, Pretoria, Middleburg, Ermelo, Wakkerstroom, Utrecht, Pietretief, southern portion of Lydenburgh, portion of Potchefstroom, and Marico, have been

compiled from actual surveys placed at the disposal of the author by the Surveyor-General of the South African Republic. The districts of Waterberg, a portion of Rustenburg and Zoutpansberg, have been compiled in the Surveyor-General's Department from Plans of Inspection under the superintendence of Government Surveyors. Much information has also been obtained from the maps and plans of Jeppe, Loveday, and others. So far as possible the boundaries of landed property have been laid down, with their names; but owing to want of reliable information the map is in this respect somewhat incomplete. The material differences between this map and those previously published will be found in the north and north-east of the Republic. The map is printed in colours, on linen; all means of communication are laid down, and the gold-fields are clearly shown. In the north-west corner of the map there is an inset of South Africa, drawn on one-tenth of the scale of the principal map. This will serve a useful purpose as showing the connection by rail between the different parts of South Africa.

AMERICA.

Brazil. **Lange.**

Kartenskizze des Rio Paranapanema-Thales. Von Henry Lange. Scale 1 : 4,000,000, or 55·5 geographical miles to an inch. Meteorologische Stationen im Staate São Paulo. Scale 1 : 6,000,000, or 82·2 geographical miles to an inch. *Petermann's Geographische Mitteilungen.* Jahrgang, 1882. Taf. 21. Gotha, Justus Perthes. *Presented by the Publisher.*

Guiana. **Ralegh.**

Sir Walter Ralegh's Karte von Guayana um 1595, von L. Friederichsen. Separatabdruck aus Festschrift der Hamburgischen Amerika-Feier, 1892. *Presented by Herr L. Friederichsen.*

AUSTRALASIA.

British New Guinea. **Surveyor-General of Queensland.**

Map of British New Guinea. Compiled from the latest Official Maps and Charts and embracing the recent inspections of districts, 1892. Scale 1 : 2,000,000, or 27·7 geographical miles to an inch. Printed and published at the Surveyor-General's Office, Brisbane, Queensland. *Presented by J. P. Thomson.*

CHARTS.

Admiralty Charts. **Hydrographic Department**

Charts and Plans published by the Hydrographic Department, Admiralty. November and December, 1892. *Presented by the Hydrographic Department, Admiralty.*

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1927	Corinto Harbour ..	New plan. Corinto Harbour. Acajutla anchorage 1927
2052	Plan of Woodbridge Haven on this sheet	.. .. ..
2789	Entrance of the river Han.	

CHARTS THAT HAVE RECEIVED IMPORTANT CORRECTIONS.

No. 2052, England, east coast :—Harwich Approaches. 125, North Sea :—Ostende Roads. 2305, Norway, west coast :—Stav Fiord to Romdals Islands. 2310, Norway, west coast :—Donnæso to Fleina. 2252, Baltic Sea :—Gulf of Bothnia. 2301, Gulf of Bothnia :—Fräderäg to Tome Point, and Gamla Karleby to Tauvö. 2694, France, north-west coast :—Channels between Ile D'Ouessant and the Mainland. 562, Spain, east coast :—Port of Valencia. 2778, River St. Lawrence :—Long Point to Lachine Rapids. 2457, North America, east coast :—Oyster and Huntington Bays. 848, Africa, east coast :—Malindi to Juba. 669, Africa, east coast :—Lamu, Manda, Patta, and Kwyhu Bays. 668, Africa, east coast :—Lamu, Manda, apd Patta Bays. 721, Indian Ocean :—Seychelles Group. 40, India, west coast :—Karáchi Harbour. 50, India, west coast :—Diu Head to Gopinath Point. 1746, Borneo, north-west coast :—Api Point to Sarawak. 287, Borneo, north coast :—Gaya Bay on the west to Sandakan Harbour on the east. 1649, Borneo, east coast :—Lankayan to Sandakan Harbour. 1650, Borneo, east coast :—Mallawallé Island to Lankayan. 2576, Sulu Sea :—Sulu Archipelago. 930, Eastern Archipelago :—Anchorages between Borneo and New Guinea. 1466, China, south coast :—Hongkong. Fotaumun Pass. 1199, China, east coast :—Kweshan Islands to the Yang-tse-kiang. 1602, China, east coast :—Approaches to the Yang-tse-kiang. 208, Japan :—Harbours and Anchorages on the east coast of Nipon. 1670a, Australia, east coast :—Moreton Bay, northern portion. 2354, Australia, east coast :—Cape Grenville to Booby Island.
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North Atlantic Ocean. **United States Hydrographic Office.**

Pilot Chart of the North Atlantic Ocean, January, 1893. With Supplement containing chart and text descriptive of the Transatlantic Steamship Routes, including the proposed routes between New York and Gibraltar. Published at the Hydrographic Office, Bureau of Navigation, Navy Department, Washington, D.C. Richardson Clover, Lieutenant-Commander, United States Navy, Hydrographer. *Presented by the United States Hydrographic Office.*

GENERAL.

The World. **Cassell.**

The Universal Atlas. Complete in 28 parts, including Index. Published by Cassell & Co., Limited, London, for the Atlas Publishing Company, Limited. Part 22. *Price* 1*s. Presented by the Publishers.*

The present issue of this atlas contains a map of Rhenish Prussia, Westphalia, Hesse Nassau, Waldeck, Lippe, and Grand Duchy of Hesse; and maps of the Polynesian Groups, South Polar Regions, New Guinea, and the Papuan Archipelago. It also includes a part of the index.

The World. **Johnston.**

W. & A. K. Johnston's Royal Atlas of Modern Geography. Edition in monthly parts. Part 15. W. & A. K. Johnston, Edinburgh and London, 1892. *Price* 4*s* 6*d. each part. Presented by the Publishers.*

This part contains maps of Australia (with inset plans), and Canada West. Each map is accompanied by an index.

The World. **Smith.**

Free Church of Scotland Mission Map. Designed by Dr. George Smith, F.R.G.S. Mercator's projection. Equatorial scale, 4° to an inch. Ruddiman Johnston & Co., Limited, London. *Presented by the Foreign Missions Committee of the Free Church of Scotland.*

This map is coloured to show the religions of the world, and the positions of the mission stations of the Free Church of Scotland. At the bottom of the map there is a table in which the names of foreign missionaries from Scotland, and their present stations are given.

The World. **Bacon.**

Commercial and Library Atlas of the World, containing one hundred double page maps, and one hundred inset maps, including all the latest discoveries, extensive letterpress description, alphabetical index, populations from the latest censuses, gazetteer of two thousand principal towns, statistical diagrams and tables, etc., etc. Edited by G. W. Bacon, F.R.G.S. London, G. W. Bacon & Co., Limited, 1893. *Price* £2 2*s.*

This atlas contains one hundred principal maps, and numerous supplementary plans. Some of these are new, but the manner in which some of the maps are produced leaves much to be desired. This is especially so with regard to the hill shading. In other cases the impressions are faint and obscure.

The World. **Kiepert.**

Kiepert's Grosser Hand-Atlas. Neue Lieferungs-Ausgabe in 45 Karten. Ausgabe in 9 Lieferungen à 5 Karten mit statistischem Material und Namen-Verzeichnis mit Bevölkerungsziffern zu jeder Karte. Dritte, im Zeichen-Institut der Verlagshandlung unter Leitung von Dr. R. Kiepert teils vollständig neu bearbeitete, teils gründlich berichtigte Auflage. Berlin 1893, Geographische Verlagshandlung Dietrich Reimer, Inhaber: Hoefer & Vohsen. *Price* 4*s. each part.*

This is the first issue of the third edition of Kiepert's well known 'Grosser Hand-Atlas.' It will be completed in nine parts, each of which will contain five maps. The present issue includes:—Maps, No 8, Hannover und Schleswig-Holstein; No. 25, Dänemark und Süd-Schweden; No. 39, Nordwestliches Africa; No. 40, Nord-America; No. 42, Mittel-America und West-Indien. It is announced by the publishers that the present edition, including statistical information by Dr. Paul Lippert, will be completed by the end of the present year; each map being accompanied by letterpress and an index. The maps contained in the present issue are nicely drawn, the colouring is well chosen, and the lettering is remarkably clear.

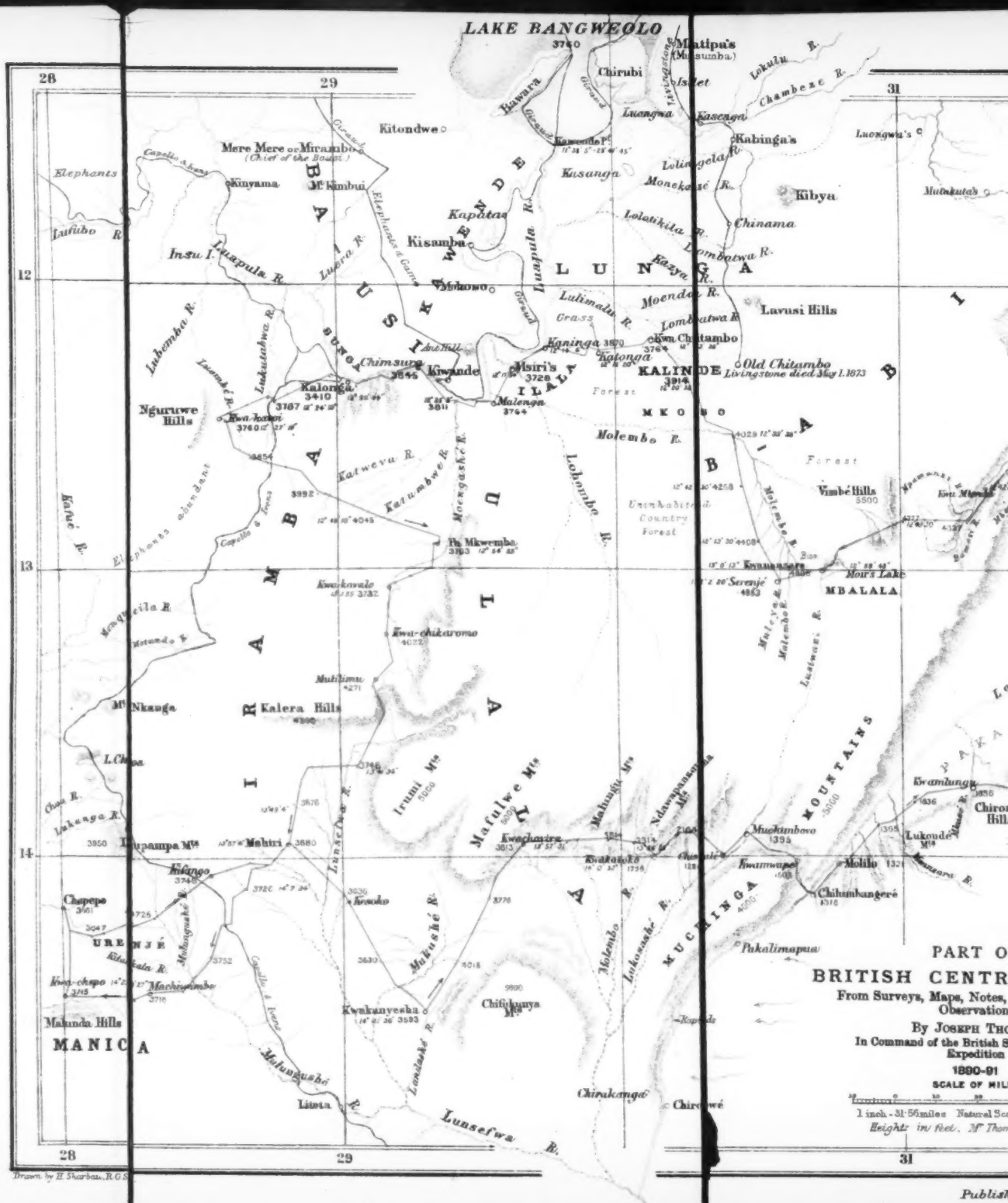
PHOTOGRAPHS.

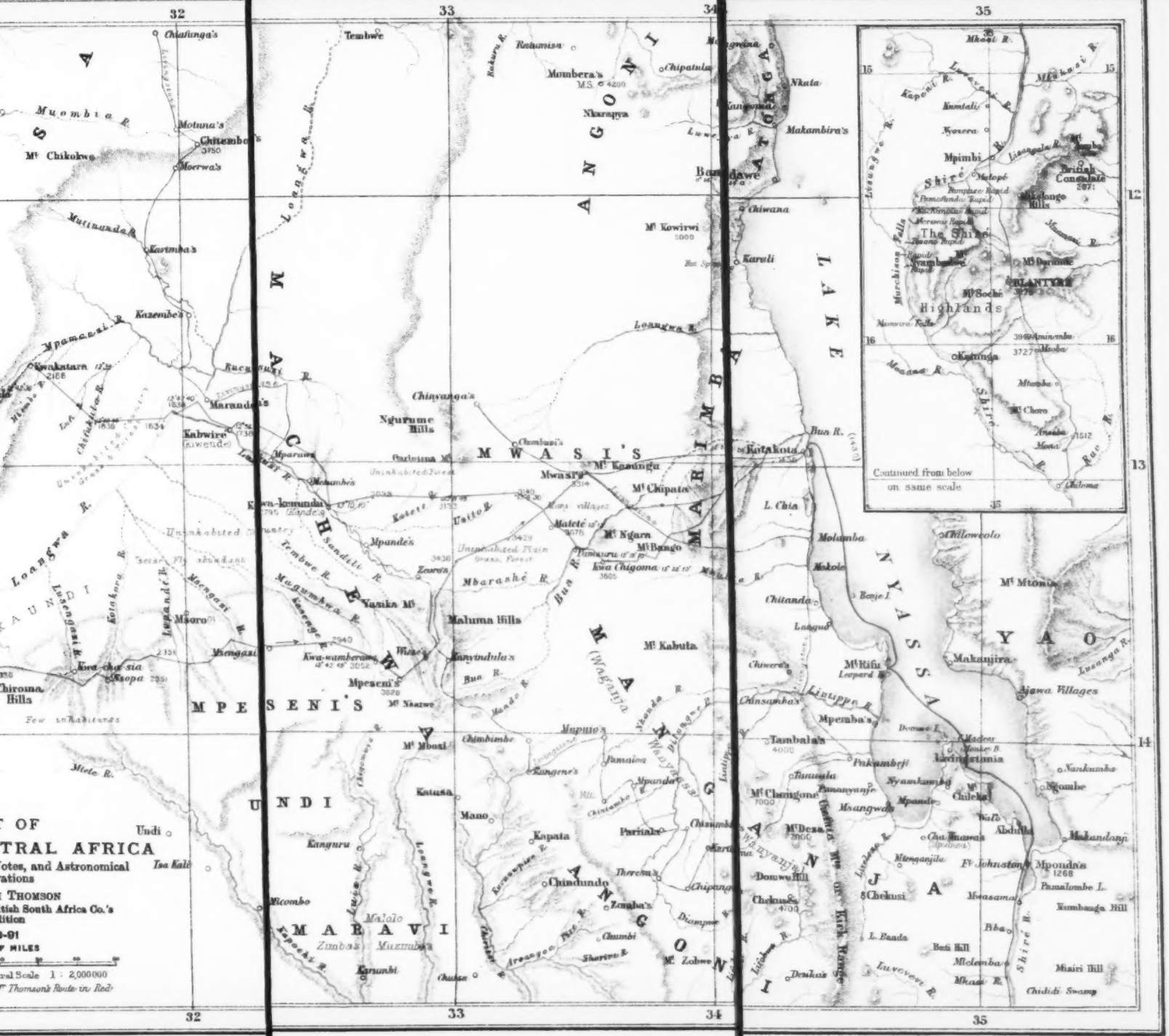
Zanzibar. **Kirk.**

Views taken in Zanzibar Island, and on the African Coast, in 1884–85. By Sir John Kirk, M.D., K.C.B., &c. *Presented by Sir John Kirk.*

This is a very interesting series of photographs They are excellent specimens of photography, and well chosen to illustrate the natural features, and antiquities of the country.

N.B.—It would greatly add to the value of the collection of Photographs which has been established in the Map Room, if all the Fellows of the Society who have taken photographs during their travels, would forward copies of them to the Map Curator, by whom they will be acknowledged. Should the donor have purchased the photographs, it will be useful for reference if the name of the photographer and his address are given.


LAKE BANGWEOLO
Matipa's (Musumba.)
Chirubi
Isalet
Lokulu R.
Chambeze R.
Luongwa R.
Kasanga
Kabinga's
Luongwa's
Kitondwe
Mere Mere or Mirambo (Chief of the Bowas)
Kinyama
Mt Kimbui
Elephants
Lufubo R.
Kapatas
Kisamba
Kasanga
Lelingela R.
Monekosé R.
Kibya
Chinama
Mutakuta's
Lolatikita R.
Lombotwa R.
Kazya R.
Insu I.
Luapula R.
Luera R.
Elephants & Game
Grand
Lulimadu R.
Moenda R.
Lavusi Hills
Grass
Lombatwa R.
Kaninga
Kwa Chitambo
Katonga
Old Chitumbo
Livingstone died May 1. 1873
KALINDE
Chimsura
Kiwande
Msiri's
ILALA
Forest
MKOMBO
Kalonga
Malenga
Nguruwe Hills
Kwa-kanzi
Lubemba R.
Lukutahwe R.
Lwambé R.
Molembo R.
Katwevu R.
Katumbwe R.
Mokogaske R.
Lohumbe R.
Kafue R.
Elephants abundant
Vimbé Hills
5500
Uninhabited Country
Forest
Pa Mkwemba
Kwa-kwale
Kwa-chikaromo
Kaqueila R.
Motundo R.
Mukilimu
Mt Nkanga
Kalera Hills
MBALALA
Moir's Lake
Serenje
Malcolm R.
Lualwa R.
Irumi Mts
5000
Mafulwe Mts
5000
Mahungu Mts
Kwachaira
Kwakanyesha
Chifichunya Mts
Mt Kapampa
Mahuri
Kitango
Chapepo
Mchinjambe
Malunda Hills
MANICA
Mokongoshé R.
Makushé R.
Lunsefwa R.
Lunsefwa R.
Kwa-chapo
Kitwala R.
Lukanga R.
Chan R.
L. Chaba
Kwamlunga
Muckimbowo
1393
Lukonde Mts
Mpalo
Kwammapesi
Chihumbangeré
MUCHINGA MOUNTAINS
Pukalimapua
Chirakanga
Chirombwé
Lunsefwa R.
Lunsefwa R.
Rapids
Liuta
Malungushé R.
Lonsiashé R.
Molembo R.
Lukoswashé R.
Kwa-chikaromo
Kwakanyesha
Kwakavale
Kwa-kanzi
Kwa-chapo
Kwa Mkwemba
Kwa Mkwemba
Kwa Mkwemba


32
33
34
35
Chisunga's
Muombia R.
Motuna's
Chitembo's
3750
Mt Chikokwe
Moerwa's
Mutanande R.
Karimba's
Kazembe's
Mpamasi R.
Kwakatara
Kabwiro
(Kiwende)
Marunda's
Loangwa R.
Unexplored
Unexplored Country
Chirouna Hills
Few Inhabitants
Miele R.
Undi
Isa Kalé
Tembwe
Mombera's
M.S. 4200
Nkaraqya
Chipatula's
Rukuru R.
Rukumisa
Loangwa R.
Mt Kowirwi
5000
Chiwanga's
Ngurume Hills
Chimbani's
Mparara
Mt Kasinga
Mwasya
5500
Mt Chipata
Mt Ngarn
Mt Bango
Kwa-kamunda
Mpandes
Kafere R.
Uatte R.
Mbarashé R.
Bua R.
Trembwe R.
Mazumbwa R.
Kwa-wamberama
Mpesenis
3678
Mt Nsarwe
Maluma Hills
Mt Kabuta
Mt Mboshi
Chimbimbe
Katuna
Mano
Kapata
Paritala
Kangwiro
Mpunde's
Chisumbe
Kangwiro's
Pamaiova
Mpunde
Chintambo
Kangwiro R.
Kangwiro Hill
Kangwiro
Chindundo
Zungaba's
Chipanga
Diampwe R.
Chumbi
Mt Zobwe
Sharinga R.
Mt Mbosi
Micombo
Malolo
Zimbas
Muzumbas
Kasambi
Ousa
Lusize R.
Lusangwe R.
Kapachi R.
Chisumbe R.
Thoresa's
Kangwiro R.
Mwanyanje R.
Mwanyanje
Mt Chamtone
7000
Mt Deza
7000
Donwe Hill
Chekusi
4700
Chekusi
Mwasama
L. Banda
Beti Hill
Mt Lemba
Mt Zobwe
Deuka's
Luveveri R.
Mkasi R.
Chididi Swamp
Misiri Hill
Bba
Shiré R.
Pamalombe L.
Kambanga Hill
Mt Mtonia
Mt Rifu
Leopard R.
Makanjira
Ajawa Villages
Chansamba's
Linuppe R.
Mpemba's
Tambala's
4000
Pakamboji
Livingstonia
Nankumba
Ngombe
Chilela
Abdulla
Makandanga
Mpondas
1268
Fr Johnston
Mpanganja
Mwanganja
Mwanganja R.
Mt Choro
Mt Durama
Mt Soche
Highlands
Kotakota
Bua R.
L. Chia
Molumba
Hilaweeolo
Chitanda
Benje I.
Makole
Lisungwe R.
Lisungwe
Chiwana
Karuli
Makambira's
Nkata
Mpimbi
Kuntali
Kyerera
Kapeni R.
Lisungwe R.
Mkasi R.
Shiré
British Consulate
Matope
Pamalombe Rapid
Mpatamanga Rapid
Chikumpata Rapid
Moroni Rapid
Mpatamanga Hills
The Shiré Highlands
Kapichira Rapid
Nyamkumbi Rapid
Nyamkumbi
Markisson Falls
Mawira Falls
Mlanje
Aminamba
Mwaba
Kasinga
Mwana R.
Mtemba
Mwana
Lisungwe R.
Continued from below on same scale
Lake Nyassa
Nyassa
Yao
Lake Nyassa
Lake Nyassa or Lake Nyanja
Nyanja
Angoni
Angoni Highlands
Mwasis
Mpesenis
Undi
Maravi
Zimbas
Muzumbas
Mariamba
Mwanyasa
Wayao
Wanyanja
Wandia
Wamanja
Wayao
Wandia
Wamanja
Wayao
Wanyanja
Wandia
Wamanja
Wayao
Wanyanja
Wandia
Wamanja
Wayao
Wanyanja